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COMPREHENSIVE DATA HANDLING SYSTEM, EMISSIONS INVENTORY/PERMITS AND REGISTRATION SUBSYSTEM (EIS/P AND R) PROGRAM: DOCUMENTATION AND USERS GUIDE

IBM Federal Systems Division

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COMPREHENSIVE DATA HANDLING SYSTEM, EMISSIONS INVENTORY/PERMITS AND REGISTRATION SUBSYSTEM (EIS/P&R) PROGRAM DOCUMENTATION AND USERS GUIDE

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When dealing with atmospheric pollution, it is necessary to amass, catalog, sort, evaluate, and perform calculations upon large volumes of data. The Emissions Inventory/Permits and Registration Subsystem (EIS/P&R) provides air pollution control agencies with the capability to create and maintain their own emission inventory and permit or registration data base and to retrieve data and generate reports from that data base. This report contains a Users Guide with each program described, input requirements described, field descriptions, etc. In addition to the basic system which an agency would need for its own operation, several preprocessor and post prossor programs are provided which perform functions necessary to make this system compatible with the EPA NEDS system. The system has an extremely powerful retrieval capability which allows the user to retrieve on practically and data field in the master file. The system also allows the user to generate his semi-annual quarterly report with a minimum of effort.

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COMPREHENSIVE DATA HANDLING SYSTEM, EMISSIONS INVENTORY/PERMITS AND REGISTRATION SUBSYSTEM (EIS/P&R) PROGRAM DOCUMENTATION AND USERS GUIDE

by

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TABLE OF CONTENTS

Page
Preface 1
1.0 Introduction 4
2.0 Emission Inventory/Permits and Registration Subsystems Overview .. 6
  2.1 Organization 7
  2.2 Communication and Data Formats 12
    2.2.1 Master File 12
    2.2.2 Transaction Records 22
3.0 File Maintenance and Retrieval 53
  3.1 File Maintenance 54
    3.1.1 Organization 64
    3.1.2 Communication and Data Formats 67
    3.1.3 Routines 70
    3.1.4 Diagnostic Messages 74
  3.2 Retrieval 78
    3.2.1 Retrieval Language Processor 79
      3.2.1.1 Organization 84
      3.2.1.2 Communication and Data Formats 86
      3.2.1.3 Routines 89
      3.2.1.4 Diagnostic Messages 101
    3.2.2 Retriever 104
      3.2.2.1 Organization 112
      3.2.2.2 Communication and Data Formats 115
      3.2.2.3 Routines 118
      3.2.2.4 Diagnostic Messages 119
4.0 Output Programs 120
  4.1 File List Output 121
    4.1.1 Organization 129
    4.1.2 Communication and Data Formats 131
    4.1.3 Routines 132
    4.1.4 Diagnostic Messages 133

Page

4.2 Summary Report Output 134
 4.2.1 Organization 152
 4.2.2 Communication and Data Formats 155
 4.2.3 Routines 157
 4.2.4 Diagnostic Messages 158
4.3 NEDS Point Source Output 159
 4.3.1 Organization 164
 4.3.2 Communication and Data Formats 167
 4.3.3 Routines 168
 4.3.4 Diagnostic Messages 169
4.4 NEDS Area Source Output 170
 4.4.1 Organization 174
 4.4.2 Communication and Data Formats 176
 4.4.3 Routines 178
 4.4.4 Diagnostic Messages 180
4.5 NEDS Area Source Report 181
 4.5.1 Organization 185
 4.5.2 Communication and Data Formats 187
 4.5.3 Routines 188
 4.5.4 Diagnostic Messages 189
5.0 Conversion Programs 191
 5.1 NEDS Point Source to EIS/P&R 192
  5.1.1 Organization 193
  5.1.2 Communication and Data Formats 195
  5.1.3 Routines 196
  5.1.4 Diagnostic Messages 197
 5.2 NEDS Area Source to EIS/P&R 198
  5.2.1 Organization 207
  5.2.2 Communication and Data Formats 210
  5.2.3 Routines 213
  5.2.4 Diagnostic Messages 214
6.0 Emission Factors Programs 215

Page
6.1 Emission Factors Table Generator 216
6.1.1 Organization 218
6.1.2 Communication and Data Formats 220
6.1.3 Routines 221
6.1.4 Diagnostic Messages 223
6.2 Emission Factors Transaction Generator 225
6.2.1 Organization 230
6.2.2 Communication and Data Formats 233
6.2.3 Routines 235
6.2.4 Diagnostic Messages 238
6.3 Emission Factors Insert 240
6.3.1 Organization 242
6.3.2 Communication and Data Formats 244
6.3.3 Routines 245
6.3.4 Diagnostic Messages 246
7.0 Sort Related Programs 247
7.1 Transaction Sorter 248
7.1.1 Organization 249
7.1.2 Communication and Data Formats 251
7.1.3 Routines 252
7.1.4 Diagnostic Messages 253
7.2 Master File Sort 254
7.2.1 Master File Sorter Generator 255
7.2.1.1 Organization 260
7.2.1.2 Communication and Data Formats 263
7.2.1.3 Routines 264
7.2.1.4 Diagnostic Messages 265
7.2.2 Master File Sorter 267
7.2.2.1 Organization 270
7.2.2.2 Communication and Data Formats 273
7.2.2.3 Routines 274
7.2.2.4 Diagnostic Messages 275

Page

Appendix A: Catalogued Procedures 276

Appendix B: Sample Run 368

Appendix C: Program Modifications 387

Appendix D: System Conversion for Tape 406

Appendix E: Glossary of Terms 408

FIGURES

Page

2.1 EIS/P&R System Flow 9
2.2.1-1 EIS/P&R Master Record Structure 14
2.2.1-2 EIS/P&R Master Record Format 15
2.2.2-1 EIS/P&R Transaction Cards 23
3.1.1 FXFILMNT Organization 66
3.2.1.1 LXLNGPRC Organization 85
3.2.1.4-1 Retrieval Control Cards 92
3.2.1.4-2 Retrieval Language Specifications 94
3.2.1.4-3 Valid Retrieval Data Names 96
3.2.2.1 Retriever Organization 114
4.1 File List Examples 122
4.1.1 PXFILPRT Organization 130
4.2-1 Permanent Summary Report Generation 139
4.2-2 Permanent Summary Report Execution 140
4.2-3 Temporary Summary Report Generation and Execution 141
4.2-3.1 Sample Job Stream 142
4.2-4 Summary Report Example 143
4.2.1 BXSUMARY Organization 154
4.3-1 NEDS Point Source Output - Data Flow and Deck 161
4.3-2 NEDS Point Source Output Example 162
4.3.1 NXNEDSCV Organization 166
4.4-1 NEDS Area Source Output - Data Flow and Deck 171
4.4-2 NEDS Area Source Output Example 172
4.4.1 AXASNEDS Organization 175
4.5-1 NEDS Area Source Report - Data Flow and Deck 182
4.5-2 NEDS Area Source Report Example 183
4.5.1 HXANREPT Organization 186
5.1.1 CXNEDSCV Organization 194
5.2-1 Area Source Categories 201
5.2-2 EIS/P&R Area Source Records 203
5.2.1 DXNEDSAS Organization 209

FIGURES (Continued)

Page

6.1.1 TXTBLGEN Organization 219
6.2 Summary of Modes of Operation and Actions 229
6.2.1 EXTRNGEN Organization 232
6.3.1 KXEMFINS Organization 243
7.1.1 IXTRNSRT Organization 250
7.2 Valid Sort Requests 257
7.2.1.1 JXSRTGEN Organization 262
7.2.2.1 Master File Sorter Organization 272

A-1 PNRANCNV - Data Flow 278
A-2 PNRBREPT - Data Flow 283
A-3 PNRCNVRT - Data Flow 290
A-4 PNRDCONV - Data Flow 295
A-5 PNREFUPD - Data Flow 300
A-6 PNRFUPDT - Data Flow 307
A-7 PNRHREPT - Data Flow 313
A-8 PNRISORT - Data Flow 318
A-9 PNRKEFIN - Data Flow 323
A-10 PNRNCONV - Data Flow 328
A-11 PNRPREPT - Data Flow 333
A-12 PNRRETVR - Data Flow 339
A-13 PNRSORTR - Data Flow 348
A-14 PNRTBGEN - Data Flow 357
A-15 Sample EIS/P&R Job Stream 364
A-16 Sample Detail List 366
A-17 Sample Summary Report 367
B-1 Sample Run 1 371
B-1.1 Sample Job Stream 372
B-2 Sample Run 2 373
B-2.1 Sample Job Stream 374
B-3 Sample Run 3 375

FIGURES (Continued)

Page

B-3.1 Sample Job Stream 376

B-4 Sample Run 4 377

B-4.1 Sample Job Stream 378

B-5 Sample Run 5 379

B-5.1 Sample Job Stream 380

B-6 Sample Run 6 381

B-6.1 Sample Job Stream 382

B-7 Segment 0 Input Forms 383

B-8 Segment 1 Input Forms 384

B-9 Segment 2 Input Forms 385

B-10 Segment 3 Input Forms 386

PREFACE

The Comprehensive Data Handling System (CDHS) is a data handling system concept intended to aid State and local air pollution control agencies in performing their daily operations and to ease their job of meeting Environmental Protection Agency (EPA) reporting requirements.

The CDHS is actually comprised of four separate subsystems which may be operated independently of each other. These subsystems are:

- The Emissions Inventory Subsystem (EIS)
- The Emissions Inventory/Permits and Registration Subsystem (EIS/P&R)
- The Air Quality Data Handling Subsystem - II (AQDHS-II)
- The Enforcement Management Subsystem (EMS).

The CDHS subsystems are provided to State and local air pollution control agencies at no charge. Each agency installs the subsystems on a computer to which it has access; and the agency can then build and maintain its own data bases. The computer programs which comprise each subsystem will be maintained by EPA.

Any modifications or extensions will be accomplished by EPA and supplied to each user as required.

The following air pollution control agency functions can be supported through use of the CDHS subsystem:

Air Quality Inventory
Emission Inventory
Enforcement Activities
Emergency Actions
Planning

Local Emissions Summary Reports
Permits and Registration Activities
Inspections and Surveillance Scheduling/Tracking
Legal Actions Scheduling/Tracking
Permit Application Scheduling/Tracking
Compliance Schedule Tracking
Personnel Scheduling
Local Enforcement Summary Reports
Federal Air Quality Reports
Federal Emissions Reports
Federal Compliance Reports

The EIS/P&R is an extension of the EIS which encompasses all capabilities of the EIS and, in addition, was designed to give the user the capability of maintaining and retrieving any data from permit or registration activities. The nature of the Permits and Registration portion of EIS/P&R gives the user the capability of maintaining many other types of data. EIS/P&R will perform all functions formerly performed by EIS. In addition, EIS/P&R will perform the following new functions:

- Allow Retrieval from the Machine Process Segment (Segment 2)
- Maintain, Process and Report Permits and Registration Data
- Allow Retrieval from the Permits and Registration Segment (Segment 3).

Improvements were made to the basic EIS Subsystem in developing the EIS/P&R subsystem. The following improvements were added to EIS/P&R:

- A Separate Transaction Sorter

- A Separate Master File Sorter

- Improved Retrieval Capabilities

- A Retrieval Answer File Always in Master File Format

- Changes to the NEDS Point Source Output and NEDS Area Source Output programs to allow ADD, CHANGE, and DELETE Capabilities

- Changes to the File Maintenance, File Print, and Transaction Generator Programs to Accommodate the Permits and Registration Data.

EIS/P&R is shown as a disk system in this manual. It is depicted as such because most users will be installing it as a disk system, but the system can easily be installed (or converted to) a tape system. The necessary information is illustrated in Appendix D.

1.0 INTRODUCTION

This document is aimed at two different audiences. Its primary target is the person who will be using the Emission Inventory/Permits and Registration Subsystem (EIS/P&R) of the Comprehensive Data Handling System (CDHS). By referring to the general program writeups, input card formats, and catalogued procedures, the EIS/P&R user should be able to use the system without reference to detailed program documentation. However, sufficient detailed documentation is provided for the programmer responsible for the maintenance of EIS/P&R. This documentation takes the form of flow diagrams, organization, data formats, and subroutines for each program in EIS/P&R, as well as several appendixes. With these goals in mind, the documentation is organized as follows:

- Section 2.0 - Contains an overview of the EIS/P&R system, a brief functional description of each component program comprising the system, and a detailed discussion of the system Master File and the general transaction cards required to build the Master File.

- Section 3.0 through 7.0 - Contain detailed functional descriptions of each program in EIS/P&R, along with complete instructions on the use of all functions. Following these are descriptions of the program logic, organization, data formats, and subroutines for each program. The sections are organized as follows:

  Section 3.0 - File Maintenance and Retrieval
  Section 4.0 - Output Programs
  Section 5.0 - Data Conversion Programs
  Section 6.0 - Emission Factors Table Programs
  Section 7.0 - Sort Related Programs

In general, each program in the EIS/P&R system is organized in the top-down manner in which higher level programming modules execute one or more lower level modules to perform specific functional tasks. These lower level modules may, in turn, execute still lower level modules to perform other specific tasks. Each module has one entry and one exit only. Thus, each program basically consists of a hierarchical structure of programming modules.

In addition, each program in the EIS/P&R system is programmed using structured programming techniques. These techniques include using only three basic types of programming construction blocks (IF/ELSE, DO, and PROCESS) and preclude the use of explicit branches. These techniques, along with the top-down organization, make for programs which are extremely readable with straightforward logic and no branching to confuse the program flow.

Because of the advanced manner in which the EIS/P&R system was developed, it became obvious that the standard method of program documentation, instruction by instruction and field by field, would not provide that level of information about the programs that IBM deemed necessary for valid understanding. Therefore, IBM has documented the EIS/P&R programs by first describing their hierarchical top-down structure and then giving detailed descriptions of each main module within the structure. Thus, the serious EIS/P&R user can find his way directly into virtually any subroutine of a given program where he will then find the programming details in the structured code.

In addition, descriptions of all the important data areas and hierarchical flowcharts of each program, as well as all the crucial high-level modules within each program, have been provided.

2.0 EMISSION INVENTORY/PERMITS AND REGISTRATION SUBSYSTEMS (EIS/P&R) OVERVIEW

When dealing with atmospheric pollution, it is necessary to amass, catalog, sort, evaluate, and perform calculations upon large volumes of data. The EIS/P&R Subsystems of the CDHS provide a systematic method for collecting this data in a data base that will provide a central source for the information needed to help control air pollution. If the system is to be helpful, it must maintain the data base, keeping the information current, and provide a means for access to the information, presenting it in a usable form.

The EIS/P&R Subsystems provide the ability to create and maintain and to retrieve and print data from the data base. The creation and maintenance is accomplished with the File Maintenance program. This program allows the user to keep his data base information current and useful. Access to the data base information is provided by the Retrieval program set. These programs provide the means of extracting desired information from the data base. The output print programs are then used to convert the extracted information to a form readable by the user. These three functions form the basic system.

In addition to the basic system, several preprocessor and postprocessor programs are provided which perform functions necessary to make this system compatible with existing systems. Other programs provide services which help make the maintenance process automatic. All system programs are described in detail in the following sections.

The format of each segment type on the Master File is illustrated in reference Figure 2.2.1-2. Each field illustrated relates directly to a field on one of the input transaction cards.

2.1 ORGANIZATION

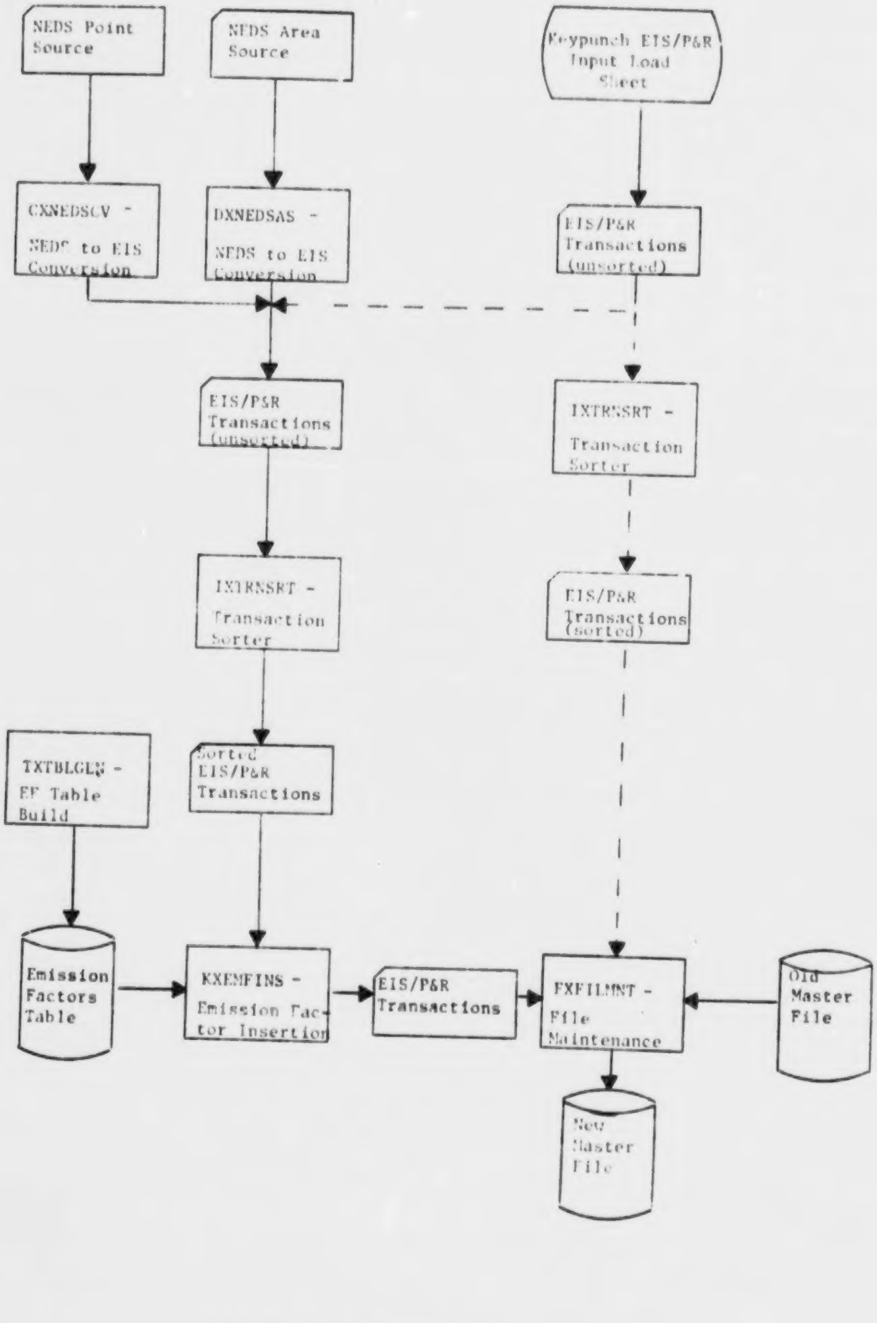
The EIS/P&R Subsystems of CDHS are organized around two main programs, File Maintenance and Retrieval. There are 13 other programs in the system that perform service functions. The EIS/P&R transaction cards serve as the interface between the File Maintenance program and those programs which feed it. The Master File serves as the interface for the rest of the programs.

The EIS/P&R components are:

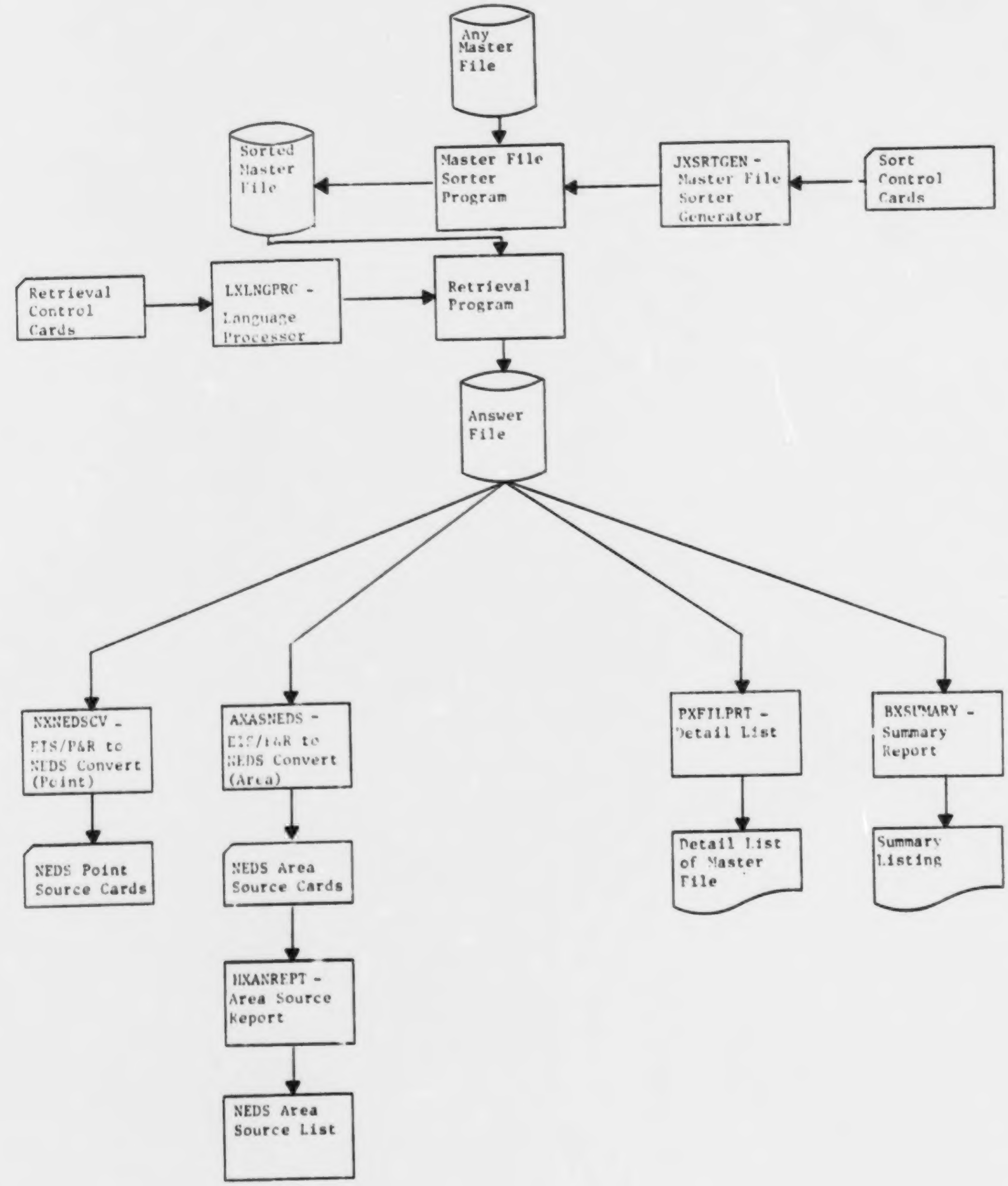
- o File Maintenance - This program is used to create and maintain the Master File.
- o Retrieval Language Processor - This program generates the Retrieval program.
- o Retrieval - This program is used to extract information from the Master File and to write this information to an Answer File (always in Master File format).
- o File List - This program provides a detailed listing of the Master File.
- o Summary Report Output - This program will produce a listing of emission totals for user-specified control breaks.
- o NEDS Point Source Output - This program converts the Master File to NEDS Point Source card formats.
- o NEDS Area Source Output - This program converts the Master File area records to NEDS Area Source card formats.
- o NEDS Area Source Report - This program prints a formatted listing of NEDS Area Source cards.
- o NEDS Point Source Conversion - This program converts NEDS Point Source cards to EIS/P&R transaction cards.
- o NEDS Area Source Conversion - This program converts NEDS Area Source cards to EIS/P&R transaction cards.
- o Emission Factor Table Generator - This program is used to generate the emission factors table.

- Emission Factor Insertion - This program inserts the emission factors into the 23 card EIS/P&R transactions.
- Emission Factor Transaction Generator - This program generates transaction cards to update emission factors in the Master File.
- Master File Sorter Generator - This program generates the Master File Sorter program.
- Master File Sorter - This program is used to produce an Answer File (always in Master File format) sorted to user specifications.
- Transaction Sorter - This program is used to sort the file maintenance transactions into proper order for use by the File Maintenance program.

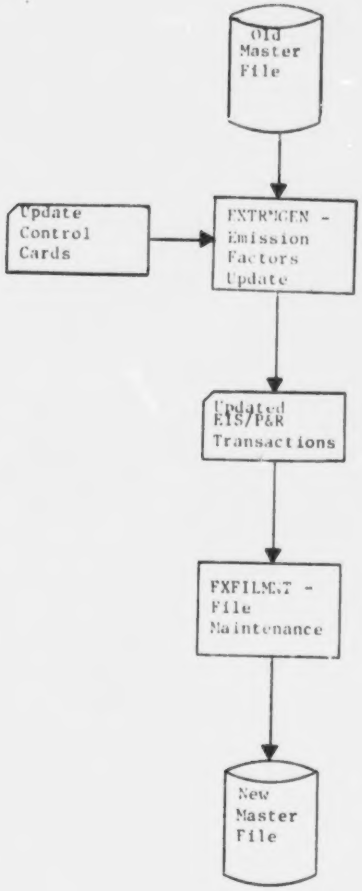
Figure 2.1 illustrates some possible flows of the EIS/P&R system.


NEDS Point Source
NEDS Area Source
Keypunch EIS/P&R Input Load Sheet
CXNEDSCV - NEDS to EIS Conversion
DXNEDSAS - NEDS to EIS Conversion
EIS/P&R Transactions (unsorted)
EIS/P&R Transactions (unsorted)
IXTRNSRT - Transaction Sorter
IXTRNSRT - Transaction Sorter
EIS/P&R Transactions (sorted)
TXTBLGEN - EF Table Build
Sorted EIS/P&R Transactions
Emission Factors Table
KXEMFINS - Emission Factor Insertion
EIS/P&R Transactions
FXFILMNT - File Maintenance
Old Master File
New Master File

EIS/P&R System Flow
Figure 2.1


Any Master File
Sorted Master File
Master File Sorter Program
JXSRTGEN - Master File Sorter Generator
Sort Control Cards
Retrieval Control Cards
LXLNGPRC - Language Processer
Retrieval Program
Answer File
NXNEDSCV - EIS/P&R to NEDS Convert (Point)
AXASNEDS - EIS/P&R to NEDS Convert (Area)
PXFILPRT - Detail List
BXSUMARY - Summary Report
NEDS Point Source Cards
NEDS Area Source Cards
Detail List of Master File
Summary Listing
HXANREPT - Area Source Report
NEDS Area Source List

EIS/P&R System Flow
Figure 2.1 (continued)

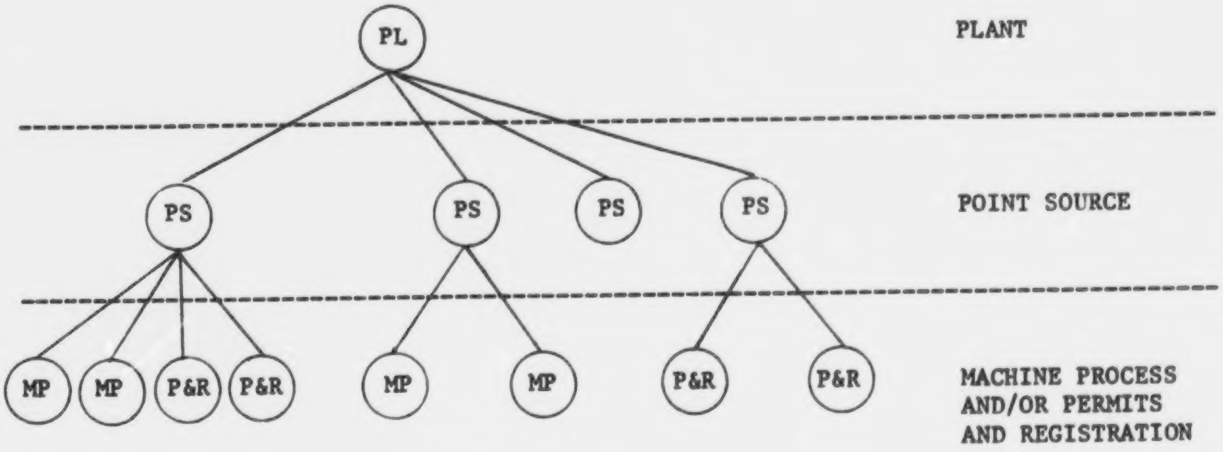

Old Master File
Update Control Cards
EXTRMGEN - Emission Factors Update
Updated EIS/P&R Transactions
FXFILMNT - File Maintenance
New Master File

EIS/P&R System Flow
Figure 2.1 (continued)

2.2 COMMUNICATION AND DATA FORMATS

2.2.1 MASTER FILE

The EIS/P&R Master File is a 3-level hierarchical file with four different segment types. The highest, or master record level segment, is called the plant segment.

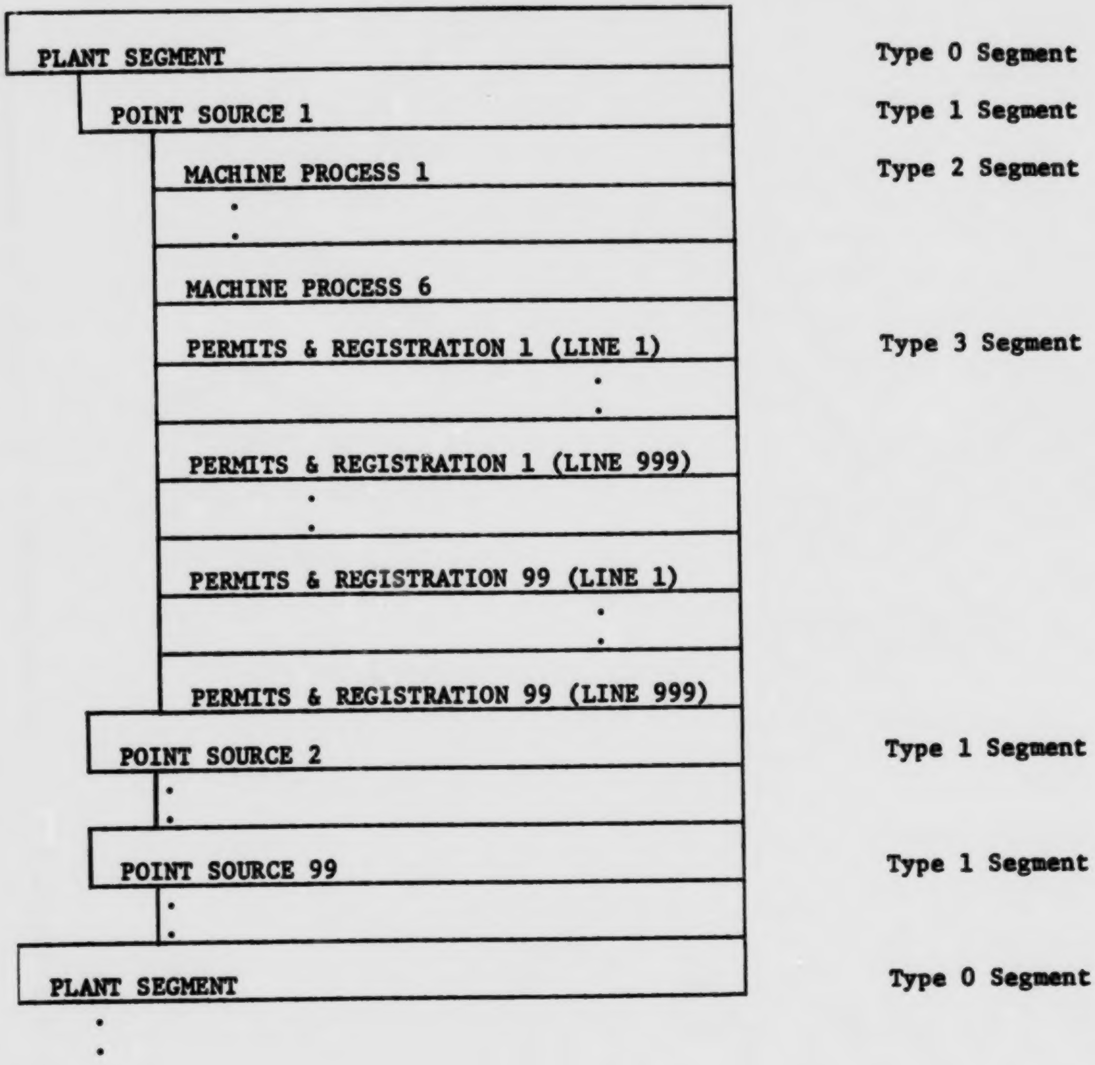

PL
PLANT
PS
PS
PS
PS
POINT SOURCE
MP
MP
P&R
P&R
MP
MP
P&R
P&R
MACHINE PROCESS
AND/OR PERMITS
AND REGISTRATION

There is no limit to the number of master records allowed on an EIS/P&R Master File. Subordinate to each master record (plant segment) may be up to 99 point source segments, each describing a different source of pollution (air stack) within the plant described by the plant segment. Subordinate to each point source segment are 1 to 6 machine process segments, each describing a different polluting process or machine feeding into the given point source, and/or 1 to 99 permits and registration segments, each made up of 1 to 999 lines of comment available for 102 characters of comments. Figure 2.2.1-1 illustrates the hierarchical structure of an EIS/P&R Master Record.

The permits and registration concept gives a new flexibility to the subsystem; that is, the ability to maintain any type of data the user deems necessary. The permit and registration segments are subordinate to each point source. There are 1 to 99 segments per point source. One or more of these segments could be reserved to be devoted entirely to a machine process also subordinate to the same point source. This decision should be made at implementation time.

EPA recommends that the user reserve the first segment of the 99 segments subordinate to each point source for future expansion. For instance, EPA is considering adding P7 cards to NEDS, and this information could be stored in the reserved segment.

The format of each segment type on the Master File is illustrated in Figure 2.2.1-2. Each field illustrated relates directly to a field on one of the input transaction cards.


PLANT SEGMENT
Type 0 Segment
POINT SOURCE 1
Type 1 Segment
MACHINE PROCESS 1
Type 2 Segment
MACHINE PROCESS 6
PERMITS & REGISTRATION 1 (LINE 1)
Type 3 Segment
PERMITS & REGISTRATION 1 (LINE 999)
PERMITS & REGISTRATION 99 (LINE 1)
PERMITS & REGISTRATION 99 (LINE 999)
POINT SOURCE 2
Type 1 Segment
POINT SOURCE 99
Type 1 Segment
PLANT SEGMENT
Type 0 Segment

- unlimited plant segments (type 0)
- up to 99 point source segments (type 1) subordinate to each plant segment
- up to 6 machine process segments (type 2) subordinate to each point source
- up to 99 permits and registration segments (type 3) composed of up to 999 lines each

EIS/P&R Master Record Structure

Figure 2.2.1-1

Fixed (Plant) Segment (Segment 0)

Position	Format	Symbol	Description
1 - 2	xx	Numeric	State Code
3 - 6	xxxx	Numeric	County Code
7 - 9	xxx	Numeric	AQCR Number
10 - 13	xxxx	Numeric	Plant ID
14 - 18	xxxxx	* Numeric	Date of Segment[1]
19 - 21	xxx	* Numeric	Segment ID
22 - 24	xxx	* Alphanumeric	User Control Region
25 - 26	xx	* Alphanumeric	Local Control
27 - 38	x-x	* Alphanumeric	User Plant ID
39 - 42	xxxx	Numeric	City
43 - 44	xx	Numeric	UTM Zone
45	A	Alphabetic	Ownership
46 - 60	A-A	Alphabetic	Contact
61 - 70	x-x	* Alphanumeric	Telephone
71 - 80	x-x	* Alphanumeric	Principal Product
81 - 128	x-x	Alphanumeric	Name and Address
129 - 132	xxxx	* Numeric	Number of Employees
133 - 138	xxxxx.x	* Numeric	Property Area
139 - 186	x-x	* Alphanumeric	Mailing Address

EIS/P&R Master Record Format

Figure 2.2.1-2

Point Source Segment (Segment 1)

Position	Format	Symbol	Description
1 - 2	xx	Numeric	State Code
3 - 6	xxxx	Numeric	County Code
7 - 9	xxx	Numeric	AQCR Number
10 - 13	xxxx	Numeric	Plant ID
14 - 18	xxxxx	* Numeric	Date of Segment[1]
19	x	* Numeric	Segment ID
20 - 21	xx	Numeric	Segment ID Sequence
22 - 23	xx	Numeric	Point ID (NEDS)
24 - 26	xxx	* Alphanumeric	Point ID (User)
27 - 30	xxxx	Numeric	SIC Code
31 - 32	xx	Numeric	IPP Code
33 - 36	xxx.x	Numeric	UTM Horizontal Coordinates
37 - 41	xxxx.x	Numeric	UTM Vertical Coordinates
42 - 47	x-x	* Numeric	Latitude
48 - 54	x-x	* Numeric	Longitude
55 - 62	x-x	Numeric	Throughput
63 - 67	xxxxx	Numeric	Normal Operating
68 - 72	xxxxx	Numeric	Boiler Design Capacity
73 - 75	xx.x	Numeric	Space Heat
76 - 79	xxxx	Numeric	Stack Height
80 - 82	xx.x	Numeric	Stack Diameter
83 - 86	xxxx	Numeric	Stack Temperature
87 - 93	x-x	Numeric	Exhaust Flow Rate
94 - 98	xxxxx	* Numeric	Velocity
99 - 102	xxxx	Numeric	Plume-Height
103 - 106	xxxx	Numeric	Points with Common Stack
107	x	Numeric	Compliance Status
108 - 111	xxxx	Numeric	Compliance Schedule

EIS/P&R Master Record Format

Figure 2.2.1-2 (Continued)

112 - 117	x-x		Numeric	Compliance Update
118	x		Numeric	ECAP
119 - 130	x-x		Numeric	Control Regulations
131 - 132	xx		Numeric	Number of Pollutants[2]
133 - 137	xxxxx	*	Numeric	Pollutant ID
138 - 144	xxxxx.xx	*	Numeric	Control Equipment Cost
145 - 147	xxx		Numeric	Primary Control Equipment
148 - 150	xxx		Numeric	Secondary Control Equipment
151 - 153	xx.x		Numeric	Estimated Control Efficiency
154 - 160	x-x		Numeric	Emissions Estimate
161 - 167	x-x	*	Numeric	Emissions Measured
168 - 174	x-x		Numeric	Allowable Emissions
175	x	*	Numeric	Emission Units
176	x		Numeric	Estimation Method
177	x	*	Numeric	Test Method

Note: Positions 133 - 177 may be repeated up to 15 times to allow for 16 pollutants from a single source. The Number of Pollutants field determines the number of repetitions.

EIS/P&R Master Record Format
Figure 2.2.1-2 (Continued)

Machine Process Segment (Segment 2)

Position	Format	Symbol	Description
1 - 2	xx	Numeric	State Code
3 - 6	xxxx	Numeric	County Code
7 - 9	xxx	Numeric	AQCR Number
10 - 13	xxxx	Numeric	Plant ID
14 - 18	xxxxx	* Numeric	Date of Segment[1]
19	x	* Numeric	Segment ID
20 - 21	xx	Numeric	Segment 1 ID
22 - 23	xx	* Numeric	Segment 2 ID
24 - 31	x-x	Numeric	SCC Code
32 - 36	xxxxx	* Numeric	BEC Code
37	x	* Numeric	Fuel Units
38 - 44	x-x	Numeric	Fuel, Process, Solid Waste
45 - 51	xxxx.xxx	Numeric	Maximum Design
52 - 54	x.xx	Numeric	Sulfur Content
55 - 57	xx.x	Numeric	Ash Content
58 - 62	xxxxx	Numeric	Heat Content
63	x	Numeric	Confidentiality of Data
64	A	Alphabetic	Source Code
65 - 89	x-x	Alphanumeric	Source Description
90	x	* Alphabetic	Emission Factor Source
91 - 92	xx	* Numeric	Number of Emission Factors[2]
93 - 97	xxxxx	* Numeric	Pollutant ID
98 - 106	xxxxxx.xxx	* Numeric	Emission Factor
107	A	* Alphabetic	Ash/Sulfur Code
108	x	* Numeric	Emission Factor Units

Note: Positions 93 - 108 may be repeated up to 15 times to allow for 16 emission factors per process. The number of Emission Factors field determines the number of repetitions.

EIS/P&R Master Record Format

Figure 2.2.1-2 (Continued)

Permits and Registration Segment (Segment 3)

Position	Format	Symbol	Description
1 - 2	xx	Numeric	State Code
3 - 6	xxxx	Numeric	County Code
7 - 9	xxx	Numeric	AQCR Number
10 - 13	xxxx	Numeric	Plant ID
14 - 18	xxxxx	* Numeric	Date of Segment[1]
19	x	* Numeric	Segment ID
20 - 21	xx	Numeric	Segment 1 ID
22 - 23	xx	* Numeric	Segment 3 ID
24 - 26	xxx	* Numeric	Line Number
27 - 128	x-x	* Alphanumeric	Comment

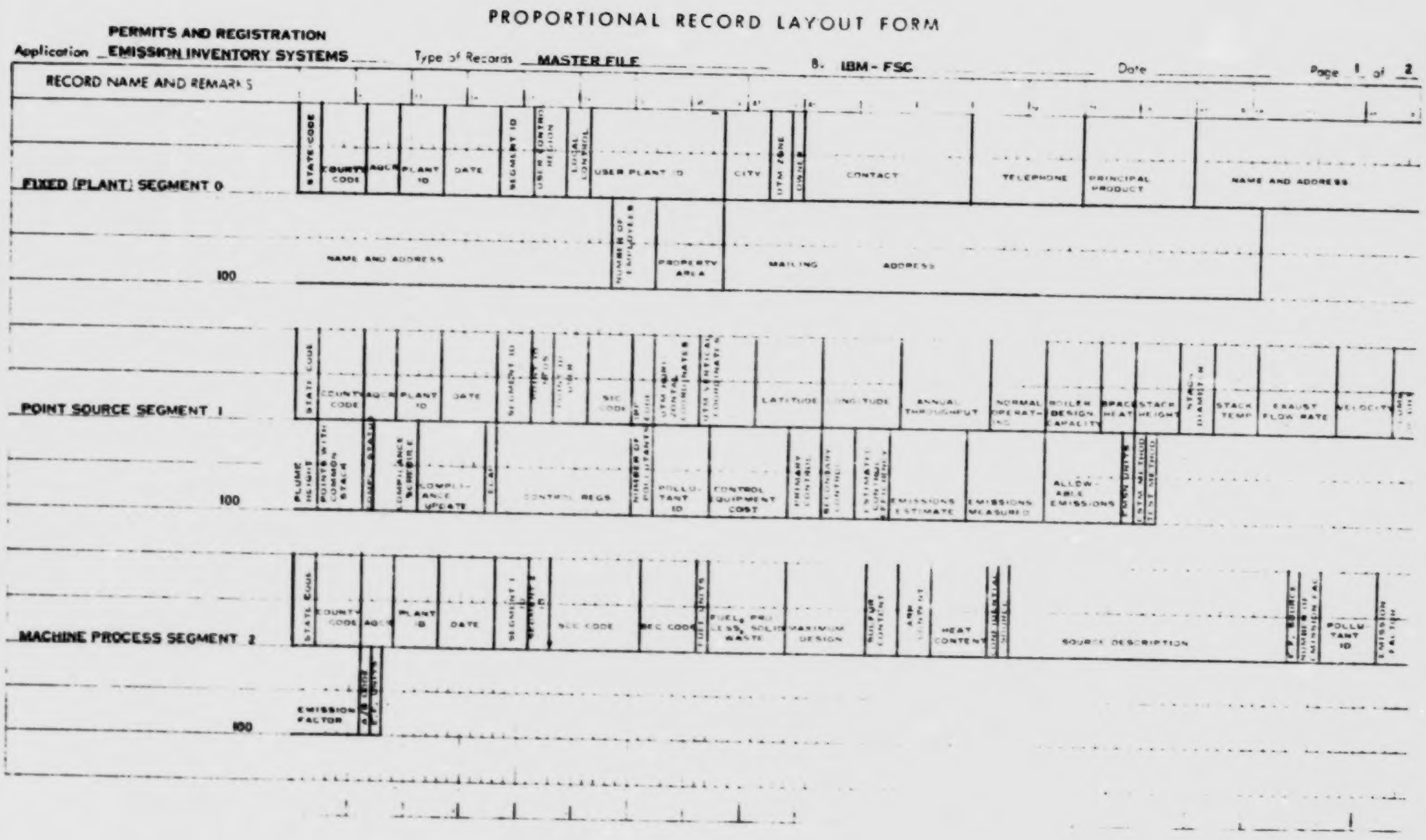
* Not part of NEDS point source file.

1 Only year portion of date obtained from NEDS point source file. Remainder of field filled with zeroes.

2 Determined by File Maintenance program.

EIS/P&R Master Record Format

Figure 2.2.1-2 (Continued)



PROPORTIONAL RECORD LAYOUT FORM

Application PERMITS AND REGISTRATION EMISSION INVENTORY SYSTEMS
Type of Records MASTER FILE
B. IBM-FSC
Date
Page 1 of 2

RECORD NAME AND REMARKS

FIXED (PLANT) SEGMENT 0
STATE CODE | COUNTY CODE | AQCR | PLANT ID | DATE | SEGMENT ID | USER CONTROL REGION | LOCAL CONTROL | USER PLANT ID | CITY | UTM ZONE | OWNER | CONTACT | TELEPHONE | PRINCIPAL PRODUCT | NAME AND ADDRESS

100
NAME AND ADDRESS | NUMBER OF EMPLOYEES | PROPERTY AREA | MAILING ADDRESS

POINT SOURCE SEGMENT 1
STATE CODE | COUNTY CODE | AQCR | PLANT ID | DATE | SEGMENT ID | [illegible] | [illegible] | SIC CODE | [illegible] | UTM HORIZONTAL COORDINATES | UTM VERTICAL COORDINATES | LATITUDE | LONGITUDE | ANNUAL THROUGHPUT | NORMAL OPERATING | BOILER DESIGN CAPACITY | SPACE HEAT | STACK HEIGHT | STACK DIAMETER | STACK TEMP | EXAUST FLOW RATE | VELOCITY | [illegible]

100
PLUME HEIGHT | POINTS WITH COMMON STACK | [illegible] | COMPLIANCE SCHEDULE | COMPLIANCE UPDATE | [illegible] | CONTROL REGS | NUMBER OF POLLUTANTS | POLLUTANT ID | CONTROL EQUIPMENT COST | PRIMARY CONTROL | SECONDARY CONTROL | ESTIMATED CONTROL EFFICIENCY | EMISSIONS ESTIMATE | EMISSIONS MEASURED | ALLOWABLE EMISSIONS | [illegible] UNITS | ESTM METHOD | TEST METHOD

MACHINE PROCESS SEGMENT 2
STATE CODE | COUNTY CODE | AQCR | PLANT ID | DATE | SEGMENT ID | [illegible] | SCC CODE | SEC CODE | FUEL UNITS | FUEL, PROCESS, SOLID WASTE | MAXIMUM DESIGN | SULFUR CONTENT | ASH CONTENT | HEAT CONTENT | [illegible] | [illegible] | SOURCE DESCRIPTION | [illegible] | NUMBER OF EMISSION FAC | POLLUTANT ID | EMISSION FACTOR

100
EMISSION FACTOR | [illegible] | [illegible] UNITS

EIS/P&R Master Record Format
Figure 2.2.1-2 (continued)

PROPORTIONAL RECORD LAYOUT FORM

Application PERMITS AND REGISTRATION. EMISSION INVENTORY SYSTEMS Type of Records MASTER FILE By IBM-FSC Date _____ Page 2 of 2

RECORD NAME AND REMARKS									
PERMITS AND REGISTRATION SEGMENT 3	STATE CODE	COUNTY CODE	AQCR	PLANT ID	DATE	SEGMENT 1 ID	SEGMENT 3 ID	LINE NUMBER	COMMENT
100	COMMENT								

EIS/P&R Master Record Format
Figure 2.2.1-2 (continued)

2.2.2 TRANSACTION RECORDS

The Master File is constructed from the information contained on the EIS/P&R input transaction cards. There are four classes (or types) of cards: a zero card, a one card, a two card and a three card. The zero card contains general identification for the plant or source; the one card contains information relative to specific emission points within a source; the two card contains fuel and process information; the three card contains permits and registration information. The following paragraphs explain the contents of each field on the transaction cards. Figure 2.2.2-1 illustrates the format of the cards. The same formats are used to enter both point source data and area source data. However, the meanings of some fields will be changed when area source data is to be entered.

Card Columns 1-18 of all Cards (Key)

CC	Format	Symbol	Description
1 - 2	xx	Numeric Code	State Code
3 - 6	xxxx	Numeric Code	County Code
7 - 9	xxx	Numeric Code	AQCR Code
10 - 13	xxxx	Numeric Code	Plant ID
14 - 18	xxxxx	Numeric	Date of Record

Card 01 - Plant Identification

CC	Format	Symbol	Description
19 - 21	xxx	Alphanumeric Code	Control Region
22 - 23	xx	Alphanumeric Code	Local Control
24 - 35	x-x	Alphanumeric Code	Plant ID
36 - 39	xxxx	Numeric Code	City
40 - 41	xx	Numeric Code	UTM ZONE
42	A	Alphabetic Code	Ownership
43 - 57	A-A	Alphabetic	Contact
58 - 67	x-x	Alphanumeric	Telephone
68 - 77	x-x	Alphanumeric	Principal Product
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

EIS/P&R TRANSACTION CARDS

Figure 2.2.2-1

Card 02 - Plant Identification

CC	Format	Symbol	Description
19 - 66	x-x	Alphanumeric	Name and Address
67 - 70	x-x	Numeric	Number of Employees
71 - 76	xxxxx.x	Numeric	Property Area
77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

Card 03 - Plant Identification

CC	Format	Symbol	Description
19 - 66	x-x	Alphanumeric	Mailing Address
67 - 77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

EIS/P&R TRANSACTION CARDS
Figure 2.2.2-1 (Continued)

Card 11 - Point Source Parameters

CC	Format	Symbol	Description
19 - 20	xx	Numeric	Segment ID
21 - 22	xx	Numeric	Point ID (NEDS)
23 - 25	xxx	Alphanumeric	Point ID (Local)
26 - 29	xxxx	Numeric	SIC Code
30 - 31	xx	Numeric	IPP Code
32 - 35	xxx.x	Numeric	UTM Horizontal Coordinates
36 - 40	xxxx.x	Numeric	UTM Vertical Coordinates
41 - 46	x-x	Numeric	Latitude
47 - 53	x-x	Numeric	Longitude
54 - 61	x-x	Numeric	% Annual Throughput
62 - 66	xxxxx	Numeric	Normal Operating
67 - 71	xxxxx	Numeric	Boiler Design Capacity
72 - 74	xx.x	Numeric	Space Heat %
75 - 77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

EIS/P&R TRANSACTION CARDS
Figure 2.2.2-1 (Continued)

Card 12 - Point Source Parameters

CC	Format	Symbol	Description
19 - 20	xx	Numeric	Segment ID
21 - 24	xxxx	Numeric	Stack Height
25 - 27	xx.x	Numeric	Stack Equivalent Diameter
28 - 31	xxxx	Numeric	Stack Temperature
32 - 38	x-x	Numeric	Exhaust Flow Rate
39 - 43	xxxxx	Numeric	Velocity
44 - 47	xxxx	Numeric	Plume Height
48 - 51	xxxx	Numeric	Points with Common Stack
52	x	Numeric	Compliance Status
53 - 56	xxxx	Numeric	Compliance Schedule
57 - 62	xxxxxx	Numeric	Compliance Update
63	x	Numeric	ECAP
64 - 75	x-x	Numeric	Control Regulations
76 - 77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

EIS/P&R TRANSACTION CARDS

Figure 2.2.2-1 (Continued)

Card 13 - Point Source Parameters

CC	Format	Symbol	Description
19 - 20	xx	Numeric	Segment ID
21 - 25	xxxxx	Numeric	Pollutant ID
26 - 32	xxxxxx.xx	Numeric	Control Equipment Cost
33 - 35	xxx	Numeric	Primary Control Equipment
36 - 38	xxx	Numeric	Secondary Control Equipment
39 - 41	xx.x	Numeric	Estimated Control Efficiency
42 - 48	xxxxxxxx	Numeric	Emissions Estimate
49 - 55	xxxxxxxx	Numeric	Measured Emissions
56 - 62	xxxxxxxx	Numeric	Allowable Emissions
63	x	Numeric	Emission Unit
64	x	Numeric	Estimation Method
65	x	Numeric	Test Method
66 - 77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic	Transaction Code

EIS/P&R TRANSACTION CARDS
Figure 2.2.2-1 (Continued)

Card 21 - Fuel, Process Parameters

CC	Format	Symbol	Description
19 - 20	xx	Numeric	Segment 1 ID
21 - 22	xx	Numeric	Segment 2 ID
23 - 30	x-x	Numeric Code	SCC Code
31 - 35	xxxxx	Numeric Code	BEC Code
36	x	Numeric Code	Fuel Units
37 - 43	xxxxxxx	Numeric	Fuel, Process, Solid Waste
44 - 50	xxxxx.xxx	Numeric	Maximum Design
51 - 53	x.xx	Numeric	Sulfur Content
54 - 56	xx.x	Numeric	Ash Content
57 - 61	xxxxx	Numeric	Heat Content
62 - 77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

EIS/P&R TRANSACTION CARDS

Figure 2.2.2-1 (Continued)

Card 22 - Fuel, Process Parameters

CC	Format	Symbol	Description
19 - 20	xx	Numeric	Segment 1 ID
21 - 22	xx	Numeric	Segment 2 ID
23	x	Numeric	Confidentiality of Data
24	x	Alphabetic	Source Code
25 - 49	x-x	Alphanumeric	Source Description
50	x	Alphabetic	Emission Factor Source
51 - 77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

EIS/P&R TRANSACTION CARDS

Figure 2.2.2-1 (Continued)

Card 23 - Fuel, Process Parameters

CC	Format	Symbol	Description
19 - 20	xx	Numeric	Segment 1 ID
21 - 22	xx	Numeric	Segment 2 ID
23 - 27	xxxxx	Numeric	Pollutant ID Code
28 - 36	xxxxxxx.xxx	Numeric	Emission Factor
37	x	Alphabetic Code	Ash/Sulfur Code
38	x	Numeric	Emission Factor Units
39 - 54	N/A	N/A	Repeat CC 23 - 38
55 - 70	N/A	N/A	Repeat CC 23 - 38
71 - 77	N/A	N/A	Not Used
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic Code	Transaction Code

EIS/P&R TRANSACTION CARDS

Figure 2.2.2-1 (Continued)

Card 30 - Permits and Registration Parameters

CC	Format	Symbol	Description
19 - 20	xx	Numeric	Segment 1 ID
21 - 22	xx	Numeric	Segment 3 ID
23 - 25	xxx	Numeric	Line Number
26	x	Alphabetic	Comment Flag
27 - 77	x-x	Alphanumeric	Comment
78 - 79	xx	Numeric	Card Number
80	x	Alphabetic	Transaction Code

EIS/P&R TRANSACTION CARDS

Figure 2.2.2-1 (Continued)

- Card Columns 1-18 of all cards:

1. State Code: State identification number as defined by the SAROAD air quality numbering system. These are listed in SAROAD Station Coding Manual for Aerometric Sampling Networks, Publication No. APTD-0907 of the Environmental Protection Agency.

2. County Code: Codes to be used are listed in the SAROAD Station Coding Manual for Aerometric Sampling Networks, Publication No. APTD-0907 of the Environmental Protection Agency.

3. AQCR Number: Number for Air Quality Control Region in which the Plant is located. These are listed in Appendix A of Guide for Compiling a Comprehensive Emission Inventory, APTD-1135.

4. Plant ID: This field identifies each source in a county. The numbering system is sequential, starting with the number one and continuing until all facilities containing point sources that are located in a given county are assigned a number. The plant ID is identical to the NEDS ID for a plant.

5. Date of Record: The Julian date for the data recorded on the card. The format for this field is YYDDD.

- **Card 01**

1. Control Region: A user-defined field to identify state or county specified control areas.

2. Local Control: A user-defined field to identify plants that are physically located in one control region, but whose control is under the jurisdiction of another control region. For example, a plant physically located in a county agency's geographical boundary but which is actually controlled by the city agency.

3. Plant ID: A user-defined field to be used if the local identification conventions differ from NEDS. However, the NEDS Plant ID must be coded.

4. City: The 4-digit SAROAD code number corresponding to the city in which the source is located. There are a few cities in the United States that are not considered to be inside any county but are considered independent entities. In such cases, enter the city code in both the City and County Code fields.

5. UTM Zone: The zone number must be known in order to locate the point source via the UTM coordinate system; this number is found on all USGS maps showing UTM coordinates. Although most states are within a single UTM zone, a few states and counties are in two UTM zones. For this reason, a UTM zone number is required for each record.

6. Ownership: A single alphabetic character ownership code. The code should be selected from the following list:

Symbol	Ownership
P	Private
L	Local Government

Symbol	Ownership
S	State Government
F	Federal Government
U	Utility

7. Contact: The last name of the person responsible for pollution control activity at the source. If the responsible individual is not identifiable, then record a descriptive and appropriate title.

8. Telephone: The area code and telephone number of the person to be contacted should be entered in this field.

9. Principal Product: A brief description of the principal product produced by this plant.

10. Card Number: 01.

11. Transaction Code: The transaction codes are:
    A - Add
    C - Change
    D - Delete.

- **Card 02**

1. Name and Address: Provide a descriptive name for the facility and a usable mailing address. Use common abbreviations as much as possible. The address should include a street number, city, and zip code. The zip code should appear in the last five positions of the field. When an EIS/P&R field (such as establishment name and address) is longer than the corresponding NEDS field, truncation will occur upon submission to NEDS. The user should be careful to code accordingly.

2. Number of Employees: Record the number of persons actually working at this location.

3. Property Area: The area, to the nearest tenth acre, of the land occupied by the facility.

4. Card Number: 02.

5. Transaction Code: The transaction codes are:
   A - Add
   C - Change
   D - Delete.

- Card 03

  1. Mailing Address: The address of the person to contact if it is different than the establishment name and address.

  2. Card Number: 03.

  3. Transaction Code: The transaction codes are:
     A - Add
     C - Change
     D - Delete.

- Card 11

1. Segment ID: Each point source set (11, 12, and a 13 card) creates a point source segment in the Master File. Each point source segment under the same facility segment must have a unique segment ID number. This number must also be used to reference a particular segment when making a change or deleting a segment. When going from NEDS to EIS/P&R the segment ID is generated automatically.

2. Point ID (NEDS): This is a sequential number designated for each pollutant discharge point within the facility. This number must be coded.

3. Point ID (Local): This field is for a user-defined point source identification when the NEDS Point ID differs from that which has been used historically by an agency.

4. SIC Code: This information is necessary to use the source data for modeling air quality. Enter the appropriate Standard Industrial Classification code.

5. IPP Code: This column should be completed with the standard process code.

6. UTM Horizontal and Vertical Coordinates: The UTM coordinate system is another means of identifying the location of the point source. Coordinates are obtained from US Geological Survey maps or their equivalent with scales less than 1:62,500. All spaces in these columns must be filled in with numbers and zeros. Accuracy to 0.1 kilometer accuracy is desired.

7. Latitude and Longitude: This is an alternate means of identifying the location of the point source. Coordinates may be obtained from USGS maps or their equivalent.

8. % Annual Throughput: The annual production, consumption, throughput, or other valid numbers representing the operating of the source should be divided proportionally into the four 3-month categories listed below. The weighted portion of production occuring in each category is reported as a percentage of total annual throughput. The field is divided into four equal subfields of two numbers each. The first two positions are for December through February. The next two are for March through May. The next two are for June through August. The last two are for September through November.

9. Normal Operating: The hours per day, days per week, and weeks per year during which the source operates under normal and usual conditions should be entered here.

10. Boiler Design Capacity: A boiler will be defined as consisting of a burner, firebox, heat exchanger, and a means of creating and directing a flow of gases through the unit. The boiler design capacity, which is defined as the boiler input capacity before heat transfer, will be entered here. Otherwise, a zero should be entered to depict nonapplicability. Units are in millions of BTU per hour based on maximum capacity or design of the boiler.

11. Space Heat %: An estimate of the percent of total fuel used for space heating at the plant should be entered here. If no fuel is used for space heating, enter zeros in this field.

12. Card Number: 11.

13. Transaction Code: The transaction codes are:

    A - Add
    C - Change
    D - Delete.

- Card 12

1. Segment ID: Enter the same number as in the Segment ID of the 11 card.

2. Stack Height: If the exact location of the discharge of pollutants is well defined, there will be a stack or some other enclosed, constrained, or physically-bounded area where pollutants are emitted. In such instances, the stack height is the vertical distance between the point of emission and ground level. If no stack can be identified or there is a changing locus of emissions within the facility, then complete only the Plume-Height field and leave the rest of the stack data blank.

3. Stack Equivalent Diameter: The stack diameter is the inside diameter of a round gas exit at the point of emission; for non-round exits, it is an equivalent diameter calculated from the cross-sectional area at point of discharge. Using a measured or estimated cross-sectional area, the equivalent diameter (De) is calculated as follows:

$$De = 1.128 \sqrt{A}$$

   where A is in square feet.

4. Stack Temperature: The temperature of the exhaust stream at the stack exit should be reported in degrees Fahrenheit under normal operating conditions. If measured temperatures are not available, an estimate to the nearest 50°F should be made.

5. Exhaust Flow Rates: This number should be specified by recording the design or maximum exhaust-gas volume unless actual measurements are available. Units are actual cubic feet per minute and represent the total volume of exhaust gas released at the operating temperature of the stack (assume gas pressure is the same as normal atmospheric pressure).

6. **Velocity:** This number should be specified by recording the design or maximum exhaust-gas velocity unless actual measurements are available. Units are feet per minute.

7. **Plume-Height:** This field is to be filled in if the previous fields on stack height data are all blank. The plume-height is a gross estimate and is used only when the source has no definable stack.

8. **Points with Common Stack:** Columns 48 and 49 contain the NEDS Point ID of the first point source discharging through the stack. Columns 50 and 51 contain the NEDS Point ID of the last point source discharging through the stack. All point numbers between these two discharge through this stack. The points which discharge through a common stack must be sequentially numbered and all these points must exist. For a complete definition of common stack see EPA publication APTD-1135, Guide for Compiling A Comprehensive Emission Inventory, for March 1973.

9. **Compliance Status:** One of the following codes must be selected to record the present status of the source under existing legal requirements:

Code	
1	Source is in compliance with the most stringent air pollution control requirements.
2	Source is not in compliance with existing legislation, and no variance has been given.
3	Source is not in compliance with existing legislation, but a variance has been given.
4	Compliance status is unknown.

10. **Compliance Schedule:** If the compliance status code is 2 or 3, enter the year and month by which this source must be in compliance.

11. Compliance Update: The day, month, and year of the most recent change in compliance status for the source must be entered in this field. Leave the field blank if compliance status has been reported as unknown (code 4). If the source is in compliance with existing air pollution control legislation, then record the time that such legislation was enacted.

12. ECAP: Certain point sources are required to submit to government agencies an Emergency Control Action Program (ECAP) that specifies a detailed plan for immediately reducing emissions whenever air pollution in an area is considered an emergency condition. The following list shall be used to denote whether or not an ECAP has been submitted to an appropriate government agency. Leave blank if status is known.

0	ECAP is not required
1	ECAP is required but has not been submitted
2	ECAP has been submitted.

13 Control Regulations: This field is used to identify air pollution control regulations that are in effect and apply to the source.

14. Card Number: 12.

15. Transaction Code: The transaction codes are:

A - Add
C - Change
D - Delete.

- Card 13

1. Segment ID: Enter the same number as in Segment ID of the 11 card.

2. Pollutant ID: This field is a 5-digit code that represents the pollutants whose emissions are being measured. Source is SAROAD Parameter Coding Manual, EPA Publication No. APTD-0633.

3. Control Equipment Cost: Enter the annual cost of maintenance and operation of pollution control equipment.

4. Primary Control Equipment: This field should be completed with the Control Equipment Identification Code. Only control devices that reduce the uncontrolled emission normally associated with the specific source process should be reported.

5. Secondary Control Equipment: If there is an additional control device installed for this pollutant, enter the Control Equipment Identification Code in this field.

6. Estimated Control Efficiency: The overall collection efficiencies in weight percent of all control equipment at the point source should be entered. Assume that the pollutant load entering the control equipment is the normal, uncontrolled quantity for that specific process.

7. Emissions Estimate: The annual, controlled emissions from the point source, in tons per year, should be entered here. These calculations should include the effect of pollutant removal by installed control equipment.

8. **Measured Emissions:** The annual, controlled emissions from the point source, in tons per year, as actually measured by test equipment should be entered here. These measurements can be compared against the estimates to check the validity of the emission factors.

9. **Allowable Emissions:** Entered here should be the maximum emissions, in tons per year, that the source is legally allowed to discharge into the atmosphere.

10. **Emission Units:** This field is for future expansion of the system. It will eventually allow the user to specify units for the emissions in other than NEDS units. It is currently ignored by the system.

11. **Estimation Method:** The following code list must be used to specify the method used to ascertain the estimated emissions:

Code	Description of Method
0	Not applicable (if emissions are negligible)
1	Stack-test results or other emission measurement
2	Material balance using engineering knowledge and expertise of process
3	Emission calculated using emission factors
4	Guess
5	Emissions calculated using a special emission factor differing from that in the SCC testing
6	New construction, not yet operational
7	Facility closed, operations ceased.

If code 3 is used, the File Maintenance program will calculate the estimated emissions if all the factors are present.

12. Test Method: A user-defined code to indicate the method used to ascertain the measured emissions.

13. Card Number: 13.

14. Transaction Code: The transaction codes are:
    A - Add
    C - Change
    D - Delete.

o **Card 21**

1. Segment 1 ID: Enter the same number as in the Segment ID of the 11 card for the point source to which this segment belongs.

2. Segment 2 ID: Each Machine-Process set (21, 22, 23) creates a Machine-Process (NEDS SCC) segment in the Master File. Each Machine-Process segment under the same point source segment must have a unique Segment 2 ID number. This number must also be used to reference a particular segment when making a change or deleting a segment.

3. SCC Code: The Source Classification Code process description that most nearly describes the process should be entered by its 8-digit numerical code. If the most appropriate SCC description appears to be significantly different from the actual process, enter nothing in this field, but enter NEW SCC NEEDED in the Source Description field of the 22 card.

4. BEC Code: Enter the Basic Equipment Classification Code that describes the equipment or process for this source. The last two digits are used to sequentially number units at the same source.

5. Fuel Units: This field is for future expansion of the system. It will eventually allow the user to specify units for the fuel-process field in other than NEDS units. It is currently ignored by the system.

6. Fuel, Process, Solid Waste: The annual figures will be reported in this field using the units associated with the SCC code for this process.

7. **Maximum Design:** The maximum hourly design rate of the most important process equipment, or the upper operating limit that generally would not be exceeded in normal practice, should be entered here. Units are expressed in those corresponding to the SCC for the process.

8. **Sulfur and Ash Content:** Entries are to be made in these columns for all combustion processes. If the process does not burn fuel, leave the field blank.

9. **Heat Content:** This field is to be completed only when the process involves combustion. Units are millions of BTU per SCC.

10. **Card Number:** 21.

11. **Transaction Code:** The transaction codes are:
    - A - Add
    - C - Change
    - D - Delete.

- Card 22

1. Segment 1 ID: Enter the same number as on the Segment 1 ID of the 21 card.

2. Segment 2 ID: Enter the same number as on the Segment 2 ID of the 21 card.

3. Confidentiality of Data: Process information occasionally is collected by a government agency under a guarantee that the data will be treated in a confidential manner and will not be released to the public. This column indicates whether or not any data for this source are officially considered confidential. A one (1) indicates confidential classification, a two (2) no classification and a blank indicates an unknown status.

4. Source Code: This is needed for NEDS reporting. Enter the following codes for the process category: B - Boiler, P - Process, C - Other Combustion unit.

5. Source Description: Enter a brief description of the source or comments as needed.

6. Emission Factor Source: If this field contains a T, the Emission Factors insertion program when used will insert the appropriate Emission Factors into the EIS/P&R 23 transaction from a table of SCC codes.

7. Card Number: 22.

8. Transaction Code: The transaction codes are:
   A - Add
   C - Change
   D - Delete.

- Card 23

1. Segment 1 ID: Enter the same number as in the Segment 1 ID of the 21 card.

2. Segment 2 ID: Enter the same number as in the Segment 2 ID of the 21 card.

3. Pollutant ID Code: This field is a 5-digit code that represents the pollutant whose emissions are being measured. Source is SAROAD Parameter Coding Manual, EPA Publication No. APTD-0633.

4. Emission Factor: The emission factor is a statistical average of the rate at which a pollutant is released to the atmosphere as a result of some activity, such as combustion or industrial production, divided by the level of that activity. The emission factors for each SCC may be found in the EPA publication Compilation of Air Pollutant Emission Factors, Publication No. AP-42.

5. Ash/Sulfur Code: This code indicates whether or not the Ash or Sulfur percentage is to be used in the calculation of the estimated emissions. The codes are: A - Ash, S - Sulfur, or blank - neither applies.

6. Emission Factor Units: This field is for future expansion. Eventually it will indicate the units in which the emission factors are expressed. The emission factors are now treated as standard NEDS units. Reference OAP Publication No. AP-42.

7. Card Number: 23.

8. Transaction Code: The transaction codes are:
    A - Add
    C - Change
    D - Delete.

Note: Card columns 23 to 38 may be repeated two more times on the same 23 card. This allows the storing of up to three sets of emission factors information on each card.

- Card 30

1. Segment 1 ID: Enter the same number as in the Segment ID of the 11 card for the point source to which this segment belongs. Each point source may have 1-99 segments (P&R) subordinates to it. Each P&R segment may have 1-999 lines of data.

2. Segment 3 ID: Each Permits and Registration set of 1 to 999 lines (each line may have a left and a right card) (30, 30,....30) creates a Permits and Registration segment in the Master File. Each Permit and Registration segment (1 to 999 lines) under the same point source segment must have a unique Segment 3 ID. This number in combination with line number (described below) must also be used to reference a particular segment when making a change, deleting a segment, or deleting a line of a segment.

3. Line Number: Each Permits and Registration line (30(L), 30(R)) creates a Permits and Registration line in the Master File. Each Permits and Registration line under the same point source and segment 3 ID must have a unique line number. This must also be used to reference a particular line when making a change, deleting a segment (enter 000 in line-number), or deleting a particular line of a segment.

4. Comment Flag: Enter an "L" for the left 51 characters of a line or an "R" for the right 51 characters of a line. Each permits and registration line card (30) creates or changes a particular part of a line. If in using a 30 add card only one side of the line is entered, the other part will be blanked if it is a new line or left as is if the line already existed. Therefore, the user can add only to an unused portion of an existing line or a new line.

5. Comment: Enter any alphanumeric data to make up a portion of a permits and registration line.

6. Card Number: 30.

7. Transaction Code: The transaction codes are:
   - A - Add
   - C - Change
   - D - Delete.

3.0 FILE MAINTENANCE AND RETRIEVAL

There are two major EIS/P&R programs for building, maintaining, and retrieving data from the EIS/P&R Master File. These are the File Maintenance program and the Retrieval program. The Retrieval program actually consists of two separate programs which work together to process a query to completion, the Retrieval Language Processor program and the Retriever program.

3.1 FILE MAINTENANCE

The File Maintenance program performs two basic functions, the creation of a new Master File and the modification of an existing system Master File. The system Master File consists of four segment types. These segment types are the plant segment (type 0), the point source segment (type 1), the machine process segment (type 2), and the permits and registration segment (type 3). The program can operate in any of three modes to support the two basic functions. These modes are ADD, CHANGE, and DELETE. Every transaction card input to the File Maintenance program must be either an ADD, CHANGE or DELETE card, identified by an A, C, or D in column 80.

ADD codes are used to create a new system Master File, and to add new records to an existing file. ADD cards are always entered in logical groupings, except in the case of adding a single type 3 segment line. Thus a type 0 segment must be added as a complete entity of one 01 card, one 02 card, and one 03 card. Similarly, a type 1/type 2/type 3 segment combination must be added subordinate to an already existing type 0 segment as a complete entity of one 11 card, one 12 card, one or more 13 cards; multiple occurrences of the set of one 21 card, one 22 card, and one or more 23 cards; and, optionally following the twos sets, one or more 30 cards. A type 2 segment cannot be added by itself. That is the 21, 22, 23 cards must be added only in conjunction with, at least, the 11, 12, 13 cards, and, possibly, 30 cards. If a particular type 1 segment already exists in the file, a type 1 delete transaction must precede the type 1/type 2/type 3 combination ADD transactions. Up to six type 2 and up to 99 type 3 segments, the latter consisting of up to 999 lines each, can exist subordinate to one type 1 segment. The exception to combination additions are single type 3 segment lines, 30 cards. Single type 3 segment lines may be added one by one to an already existing type 1 segment.

CHANGE and DELETE cards are used to modify an existing system Master File. Any data field specified as non-blank on a CHANGE card will replace the corresponding field in the designated file record. CHANGE cards use the same format as ADD cards except that all data fields other than the fields being changed are left blank by the user. Thus any field on any card can be changed except the record key, segment 1, 2 or 3 IDs, segment 3 line number, and pollutant ID. DELETE cards can be used to delete an entire logical record (type 0 segment and all subordinate type 1, 2, and 3 segments), a type 1 segment (with all subordinate type 2 and 3 segments), a single type 2 segment, a single type 3 segment, or a single type 3 segment line.

All transaction cards entered into the File Maintenance program must be sorted in Master File sequence and by action type (DELETE, ADD, CHANGE) either by the user or by the Transaction Sorter program, as the Master File is passed only once per run for fast performance.

The file maintenance program performs as follows. The old system Master File is read in its entirety once from beginning to end. All input transaction cards are passed against the file in the order they are read. According to the action called for on the card, records are added to the file, changed on the file, or deleted from the file. The result of the File Maintenance program is a new system Master File, modified according to the transaction cards. In the case of file creation, there is of course, no old Master File. Thus, all the ADD transaction cards are used to create new records and add them to the new Master File.

ADD Cards

Records are created or added to the Master File using the following combinations of ADD cards. Only those fields with the name filled in are required. All other fields may be blanks. At least the three cards shown in the type 0, 1, and 2 segments are required to create each of these segments. The type 3 segment may be created with the one card shown.

- To add a plant segment (type 0 segment):

```
|KEY | DATE |                                      | 01 | A|
|KEY |      |                                      | 02 | A|
|KEY |      |                                      | 03 | A|
 1 13 14  18                                        78  79 80
```

- To add a point source segment (type 1 segment) which is allowed to have subordinate to it up to six machine process segments (type 2 segments) and up to 99 sets of 999 lines of permits and registration segments (type 3 segments):

```
| KEY |  DATE | ID |          |                   |11  | A|
| KEY |       | ID |          |                   |12  | A|
| KEY |       | ID | POLL. ID |                   |13  | A|    up to 16 cards
 1  13 14   18 19 20 21      25                    78 79 80

| KEY |  DATE | ID  | ID2 |          |            |21  | A|    up to 6 sets
| KEY |       | ID  | ID2 |          |            |22  | A|    with up to 16
| KEY |       | ID  | ID2 | POLL. ID |            |23  | A|    23 cards per
 1  13 14   18 19 20 21 22  23      27             78 79 80    set

| KEY | DATE | ID  | ID3 | LINE NBR | COMMENT FLAG| 30 | A|    up to 99 sets
 1  13 14  18 19 20 21 22  23      25 26           78 79 80    with 999 lines
                                                               per set (each
                                                               line may have
                                                               an 'L' and an
                                                               'R')
```

Up to 16 unique pollutant IDs are allowed. Thus, multiple type 13A and 23A cards are allowed. One, two, or three pollutant IDs can be present on any type 23A card. Since up to six (there must be at least one) machine process segments can be subordinate to any point source segment, there can be up to six sets of the 21A/22A/multiple 23A type cards following the last 13A card for each point source segment. Also since up to 99 (there may be none) permits and registration segments can be subordinate to any point source segment, there can be up to 99 sets (with 999 lines, each possibly having an 'L' and an 'R') of 30A type cards following the last 23A card for the point source segment.

- To add a permits and registration segment line (type 3) or permits and registration (type 3) segment.

KEY	DATE	ID	ID3	LINE NBR.	COMMENT FLAG		30	A
1 13	14 18	19 20	21 22	23 25	26		78 79	80

Up to 99 permits and registration segments may be added to an existing point source segment. Each segment may have up to 999 lines, each composed of a left, 'L', and a right, 'R', side of the comment. Therefore, to add a completely filled line, both an 'L' 30A card and an 'R' 30A card must be entered (this giving 999 x 2 cards possible for each segment). Lines may be inserted or parts of lines may be added. If only one side of a line is entered, the other part will be blanked except when the line already existed with alphanumeric data present in that part of the line. The half which is blanked because only one half of the line is entered orginally, may be entered later by an ADD to the blank half or a CHANGE to the blank half line (see CHANGE Cards).

- To add a machine process segment (type 2) to an existing point source (see special case following explanation of DELETE Cards).

CHANGE Cards

Any record on an existing Master File can be changed through the use of a CHANGE card. Depending on the segment type being changed, certain fields on the card are required to be filled in. Other than these required fields, any other fields on the card which are non-blank will replace the corresponding field of the indicated record on the Master File. The only exception to this is the type 3 segment comment field which may validly be changed to blanks.

To change a field in a Master File record, only the single transaction card which contains that field need be used. For example, assume that the field called COMPLIANCE-STATUS is to be changed. This field is part of the point source segment and is included in the type 12 transaction card. Thus, only a type 12 CHANGE card is required. The types 11 and 13 cards are unnecessary.

The following is the format for each type of change card with the required fields filled in by name.

- Type 01 change card

KEY	DATE		01	C
1 13	14 18		78 79	80

- Type 02 change card:

KEY	DATE		02	C
1 13	14 18		78 79	80

- Type 03 change card:

KEY	DATE		03	C
1 13	14 18		78 79	80

- Type 11 change card:

KEY	DATE	ID		11	C
1 13	14 18	19 20		78 79	80

- Type 12 change card:

```
|KEY | DATE | ID |                                              | 12  | C|
1  13 14  18 19 20                                              78 79 80
```

- Type 13 change card:

```
|KEY | DATE | ID | POLL. ID |                                   | 13  | C|
1  13 14  18 19 20 21      25                                   78 79 80
```

- Type 21 change card:

```
|KEY | DATE | ID | ID2|                                         | 21  | C|
1  13 14  18 19 20 21 22                                        78 79 80
```

- Type 22 change card:

```
|KEY | DATE | ID | ID2|                                         | 22  | C|
1  13 14  18 19 20 21 22                                        78 79 80
```

- Type 23 change card:

```
|KEY |DATE | ID | ID2 | POLL. ID |                              | 23  | C|
1  13 14  18 19 20 21 22 23     27                              78 79 80
```

- Type 30 change card:

```
|KEY |DATE | ID | ID3 | LINE NBR | COMMENT FLAG| COMMENT     | 30  | C|
1  13 14  18 19 20 21 22 23    25 26             27      77 78 79 80
```

DELETE Cards

Each of the four segments (or segment combinations) and the separate lines of segment type 3 can be deleted from an existing Master File. The following cards, with required fields filled in, illustrate how to delete these choices.

- o Delete an entire logical record of plant (type 0) segment and all subordinate point source (type 1), machine process (type 2), and permits and registration (type 3) segments:

```
| KEY |                                                            | 01 | D|
1  13                                                             78 79 80
```

- o Delete a point source (type 1) segment, and all subordinate machine process (type 2) and permits and registration (type 3) segments:

```
| KEY |       | ID |                                               | 11 | D|
1  13         19 20                                               78 79 80
```

- o Delete a machine process (type 2) segment:

```
| KEY |       | ID | ID2 |                                         | 21 | D|
1  13         19 20 21 22                                         78 79 80
```

- o Delete a permits and registration (type 3) segment:

```
| KEY |       | ID | ID3 | 000 |                                   | 30 | D|
1  13         19 20 21 22 23 25                                   78 79 80
```

The number field (cc 23-25) must be zero to delete an entire segment.

- Delete a permits and registration (type 3) segment line:

```
|KEY |      |ID  |ID3 | LINE NBR |                                  |30  |D|
1  13       19 20 21 22 23       25                                 78 79 80
```

The line number field (cc 23-25) must be non-zero to delete a specific line of a type 3 segment. This will delete the entire line (both left and right halves of the comment).

In general, the KEY, IDs, card number, line number (if any), and transaction code are required for all types of transactions. In addition, the POLL. ID and DATE are required for adding or changing information in the master file.

Special Case

- To add a machine process segment (type 2) to an existing point source segment (type 1):

```
|KEY |      |ID |                                          |11  |D|
1  13       19 20                                         78 79 80

|KEY |DATE |ID |                                 |11  |A|
|KEY |     |ID |                                 |12  |A|
|KEY |     |ID |POLL.ID |                        |13  |A|    up to 16 cards
1  13 14 18 19 20 21   25                        78 79 80

|KEY |DATE |ID |ID2 |                            |21  |A|    up to 6 sets
|KEY |     |ID |ID2 |                            |22  |A|    with up to 16
|KEY |     |ID |ID2 |POLL.ID  |                  |23  |A|    23 cards per set
1  13 14 18 19 20 21 22 23     27                78 79 80
```

```
| KEY | DATE | ID | ID3 | LINE NBR | COMMENT FLAG| | 30 | A |
1  13 14  18 19 20 21 22  23      25 26             78 79 80
```

up to 99 sets
with 999 lines
per set (each
line may have an
'L' and an 'R')

A machine process segment (type 2) may not be added individually to a Master File. It may only be added in combination with a point source segment (type 1) and possibly permits and registration segments (type 3). If a point source already exists, that point source, along with its existing type 2 and type 3 records, must be deleted first. This is accomplished by using the point source (type 1) DELETE which deletes all corresponding type 2 and type 3 records. Then the point source segment (type 1) and any already existing machine process segments (type 2) and permits and registration segments (type 3) must be re-added to the file along with the new machine process segment (type 2).

To avoid all the manual coding as shown above, a procedure is recommended to alleviate this. The procedure follows:

1. Retrieve entire record of the facility to be changed (see subsection 3.2).

2. Execute the Emission Factors Transaction Generator to create the necessary delete card and recreation of the entire record (see subsection 6.2).

3. Execute the IBM utility IEBGENER to add the new machine process transactions to those generated in step 2 above.

4. Execute the Transaction Sorter which will merge the new machine process transactions with those created by the Transaction Generator (see subsection 7.1).

5. Execute File Maintenance which will DELETE the existing records and ADD the new record along with the old records to the new Master File.

3.1.1 ORGANIZATION

The following are the main modules of the File Maintenance program.

- MAIN-LOOP

  This routine is performed by ROOT-SEGMENT until all transactions have been processed. READ-TRANS is called to read each transaction card. Then, depending on the type of card read, ADD-RECORD, CHANGE-RECORD, or DELETE-RECORD will be performed unless an invalid transaction card was read. This is processed as an error and the next transaction is read.

- ADD-RECORD

  This routine, performed by MAIN-LOOP, processes the adding of a record to the system Master File. Depending on the card identification of the ADD card, a routine will be performed which will add a root (plant) segment to the file, add a point source and all related machine process records to the file, add a set of permits and registration line records to an existing point source in the file, or process an invalid transaction card.

- COPY-MASTER

  This routine, called by ROOT-SEGMENT, completes copying of the old system Master File (if any) to the new, after all input transactions have been processed.

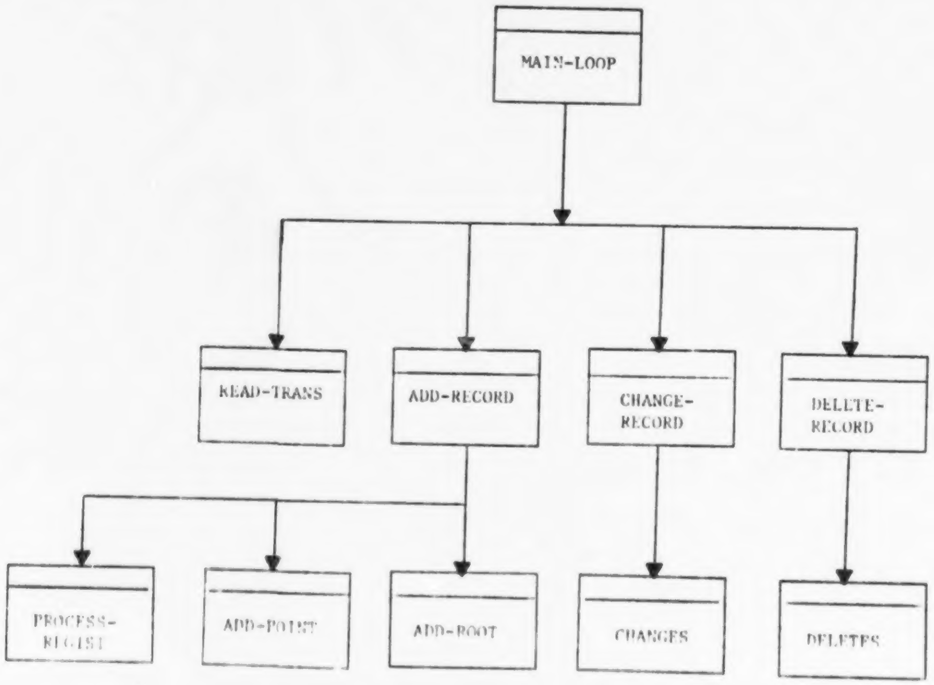
- CHANGE-RECORD

  This routine, performed by MAIN-LOOP, processes the changing of a record on the system Master File. This routine performs lower level subroutines to edit the CHANGE transaction card, locate and read into core the record to be changed, perform all changes to the record, and write the updated record back out on the new Master File.

- DELETE-RECORD

  This routine, performed by MAIN-LOOP, processes the deletion of a record from the system Master File. This routine performs lower level routines to edit the DELETE transaction card, locate the record to be deleted, and delete the record from the new Master File.

Figure 3.1.1 illustrates the organization of FXFILMNT.


MAIN-LOOP
READ-TRANS
ADD-RECORD
CHANGE-RECORD
DELETE-RECORD
PROCESS-REGIST
ADD-POINT
ADD-ROOT
CHANGES
DELETES

FXFILMNT Organization
Figure 3.1.1

3.1.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the File Maintenance program.

- ERR-1 through ERR-27 - The number of each of the 27 file maintenance error messages, corresponding to the messages themselves in ERROR-MSGS. (See subsection 3.1.4 for actual error messages).

- ERR-CODE - Contains the number of the error message to be printed whenever an error is detected.

- LINE-MAX - Number of lines to print per page of file maintenance output listing. Currently set to 52.

- MAX-CARD-1 - Maximum number of type 13 transaction cards allowed. Currently set to 16.

- MAX-CARD-2 - Maximum number of type 23 transaction cards allowed. Currently set to 16.

- MAX-SET-2 - Maximum number of type two segments subordinate to a single type one segment. Currently set to six.

- CONTROL-SWITCHES - These are the program switches to control internal logic. The main switches are:

  ADD-123-SW - Determines whether the add transaction for the type 3 segment being processed is being added singly or in combination with type 1/type 2 segments. Turned on when adding type 1/type 2 segments.

EOF-SW - Controls the top-level looping of the MAIN-LOOP routine. Turned on at transaction file end.

READ-SW - Determines whether or not the next transaction card should be read (in MAIN-LOOP), depending on whether or not the current card has yet to be processed.

REJECT-3-SW - Controls the rejection of all corresponding 30A transactions following an error in a combination type 1/type 2/type 3 ADD. Turned on when an error in adding type 1/type 2 transactions has occurred.

- ERROR-MSGS - The 27 messages used to describe any detected errors. These messages are referenced by setting the field ERR-CODE to one of the values contained in ERR-1 through ERR-27.

- OLD-CONTROL - Contains the record KEY, date, and segment 1 and segment 2 or 3 ID fields of the current old Master File record residing in the core.

- SAVE-ALL-SET-2 - Contains all the type 2 segments (up to 6) subordinate to the type 1 segment in SAVE-POINT during CHANGE and DELETE logic.

- SAVE-POINT - Contains the type 1 segment related to the type 2 segments stored in SAVE-ALL-SET-2 during CHANGE and DELETE logic.

- SAVE-CARD - Contains the first two cards of any three card set (01, 02, 03; 11, 12, 13; 21, 22, 23) during the building of that set during ADD processing or contains the first 30 card encountered for the build of a permits and registration (type 3) line.

The WORKING-STORAGE fields MAX-CARD-1 and MAX-CARD-2 indicate the maximum number of pollutants each record in the Master File will now handle. To increase or decrease the number, change the "OCCURS 1 TO 16 TIMES" clause for the repeating portion of the MSTR-POINT-SOURCE record and the MSTR-MACHINE-PROCESS record. MAX-CARD-1 and MAX-CARD-2 must be changed to the same number as the 16 is changed to. All programs using the Master File must be changed and recompiled to incorporate the change. For further details on these changes, see Appendix C.

The WORKING-STORAGE field MAX-SET-2 determines the maximum number of type two segments that can be held in core at any given time. If this number is changed, the "SAVE-SET-2 OCCURS 6 TIMES" must be changed also. Whenever any of these MAX fields are increased, the amount of core storage must be increased when the programs are to be run. For further details on these changes, see Appendix C.

3.1.3 ROUTINES

The following are internal subroutines of the File Maintenance program.

- ADD-ROOT

  This routine, performed by ADD-RECORD, will add a root segment (plant segment, type 0) record to an EIS/P&R Master File. The required 01, 02, and 03 type transaction cards are read and edited, and routine LOCATE-SET0 is performed to read the old Master File (if any) and determine where on the file the new root segment should be added. The segment is then built from the three input cards and added to the new Master File.

- ADD-POINT

  This routine, performed by ADD-RECORD, will add a point source segment (type 1) and all subordinate machine process segments (type 2) to an EIS/P&R Master File. The 11, 12, multiple 13, and all occurrences of the 21, 22, and multiple 23 type transaction cards are read and edited. Subroutine ADD-SET1 is performed to locate the place in the old Master File (if any) where the new segments are to be added, the CALCULATIONS subroutine is performed to calculate the estimated emissions, a flag is set for PROCESS-REGIST indicating that the location has been found for any subordinate permits and registration records (type 3) that correspond to this point source, and the new type 1/type 2 segments are added to the Master File.

- PROCESS-REGIST

This routine, performed by ADD-RECORD, will control the adding of new permits and registration (type 3) records. The location for this addition has either already been found by ADD-SET1 if these 30A cards are in combination with 11, 12, 13, 21, 22, and 23 type transaction cards or is found by POSITION-TO-3 for a type 3 record being added to an existing point source. If an error in adding a type 1/type 2/type 3 set is found, REJECT-ALL-3 is called to reject remaining 30A transactions related to the combination ADD. If no error occurs and this is a type 1/type 2/type 3 add, ADD-SET3 is called to add these new permits and registration records or if this is a single permits and registration line addition to an existing point source, ADD-REGIST is called to add this line record.

- CHANGES

This routine, performed by CHANGE-RECORD, actually performs the changes as defined by the CHANGE transaction card, to the old Master File. The record to which the changes are to be made is read into core. Except in the case of the 30C transaction where COMMENT being blank will cause the blanking of that portion of COMMENTS in the appropriate permits and registration record, the change card is scanned for non-blank fields. Each such field is used to replace the corresponding field in the record. After all the change fields on the card are updated to the record, the update record is written into the new Master File.

- DELETES

This routine, performed by DELETE-RECORD, actually performs the deletion of the logical segment type or the specific line record (in the case of a non-zero line number in the 30D card for a permits and registration record) as specified on the DELETE transaction card. If segment type 0 (plant segment) is to be deleted, all physical records with the specified key will be deleted from the file. If segment type 1 (point source segment) is to be deleted, all physical records with the specified key and the specified set one ID will be deleted from the file. If segment type 2 (machine process segment) is to be deleted, the one physical record with the specified key, set one ID, and set two ID will be deleted from the file. If segment type 3 (permits and registration segment) is to be deleted, indicated by 000 in the LINE-NUMBER field, the entire set of physical (1 to 999) records with the specified key, specified set one ID and specified set three ID will be deleted from the file. If a line of a segment type 3 (permits and registration segment) is to be deleted, the one physical record with the specified key, specified set one ID, specified set three ID and specified line-number will be deleted from the file.

- ADD-REGIST

This routine, performed by PROCESS-REGIST, adds a permits and registration (type 3) record corresponding to an existing point source (type 1) record to an EIS/P&R Master File. Routine BUILD-REGIST or ADD-TO-PREV-LINE is called to edit the transaction and build the line in core.

- ADD-SET3

This routine, performed by PROCESS-REGIST, adds the permits and registration (type 3) segments subordinate to a newly created point source (from the type 1/type 2/type 3 ADD being processed) to an EIS/P&R Master File. Subroutine BUILD-REGIST is called to edit the transaction and build the line in core.

o CALCULATIONS

This routine is performed whenever a type 1 segment is added to the Master File or changed, or whenever any type 2 segment is changed or deleted. The subroutine calculates the estimated emissions for each pollutant ID in the type 1 and type 2 segments. Basically, the computation is performed in three parts. First in subroutine PRELIMINARY-COMPUTATION, the fuel process rate is multiplied by the emission factor. Next, in subroutine ASH-SULFUR-ADJUSTMENT, the product of the previous multiplication is multiplied by whichever (if any) content is specified, ash or sulfur. Last, in subroutine FINAL-COMPUTATION, the adjusted product is multiplied by the control efficiency factor, reduced by the emission reduction amount and divided by pounds per ton. *A field overflow during any arithmetic operation will result in a final estimated emission of zero.*

3.1.4 DIAGNOSTIC MESSAGES

The following are the diagnostic messages that may be generated during file maintenance.

Message: Set incomplete - this card ignored.
Meaning: If in adding a type 1/2/3 set a required card is missing or rejected in the set, each card thereafter of this set will be rejected with this accompanying message.
Action: Correct error and resubmit transactions.

Message: Invalid transaction type - card rejected.
Meaning: Transaction code is other than A, C, or D.
Action: Correct error and resubmit transaction.

Message: Numeric edit failure - card rejected.
Meaning: An alphabetic character is contained in a numeric field.
Action: Correct error and resubmit transaction(s).

Message: Duplicate set 0 already on file - set rejected.
Meaning: If a 0 segment having the same key already exists, a duplicate set will not be accepted.
Action: Correct error and resubmit transaction.

Message: Too many type 13 cards - card rejected.
Meaning: A maximum of 16 type 13 cards is allowed.
Action: Correct error and resubmit transaction(s).

Message: Too many type 23 cards - card rejected.
Meaning: A maximum of 16 type 23 cards is allowed per set. (Six sets of type 2 segments are permitted however)
Action: Correct error and resubmit transactions.

Message: No set 0 found for previous set 1 - set rejected.
Meaning: A 0 set must either exist in the file or precede a 1 set in the input stream. Sorting the cards should put them in proper sequence if a 0 set is included.
Action: Correct error and resubmit transactions.

Message: Duplicate set 1 already on file - set rejected.
Meaning: Same as for duplicate set 0.
Action: Correct error and resubmit transactions.

Message: Too many set 2 under one set 1 - set rejected.
Meaning: Only permitted six sets of type 2 segments under each type 1 set.
Action: Correct error and resubmit transactions.

Message: Invalid segment/card number - card rejected.
Meaning: Segment or card number is in error.
Action: Correct error and resubmit transactions.

Message: No matching key on master file - card rejected.
Meaning: There is no key in the file to match the key on the transaction card.
Action: Correct error and resubmit transactions.

Message: Can only delete 01, 11, 21 or 30 set - card rejected.
Meaning: It is not possible to delete an individual 02, 03, 12, 13, 22, or 23 card. The entire set must be deleted.
Action: Correct error and resubmit transactions.

Message: Set 0 incomplete - set rejected.
Meaning: One or more cards is missing from the set 0 segment.
Action: Correct error and resubmit transactions.

Message: Sets 1/2/3 incomplete - entire set rejected.
Meaning: One or more cards missing from the 1, 2 or 3 segments.
Action: Correct error and resubmit transactions.

Message: Set 0 rejected.
Meaning: This message will appear in combination with one of the other specific error messages for set 0.
Action: Correct error and resubmit transactions.

Message: Set 1 and all subordinate sets rejected.
Meaning: This message will appear in combination with one of the other specific error messages for set 1.
Action: Correct error and resubmit transactions.

Message: Overflow during calculations for pollutant XXXXX.
Meaning: The number of digits in the result of a calculation exceed the amount of space available. This results in digits being dropped, giving an erroneous answer. The estimated emissions will be set to zero.
Action: Correct error and resubmit transactions.

Message: Estimates will be incorrect.
Meaning: This message follows the one above.
Action: Correct error and resubmit transactions.

Message: Transaction card out of order - card rejected.
Meaning: Transaction cards must be in DELETE, ADD, CHANGE sequence in input stream.
Action: Correct error and resubmit transactions.

Message: Set-ID invalid - card rejected.
Meaning: An error exists in the set-ID.
Action: Correct error and resubmit transactions.

Message: Line number zero for ADD or CHANGE - card rejected.
Meaning: Line number zero (for set 3) is only used to DELETE the entire segment.
Action: Correct error and resubmit transaction.

Message: Comment-flag invalid - card rejected.
Meaning: Only an "L" or an "R", indicating left or right side of line, is a valid comment flag.
Action: Correct error and resubmit transaction.

Message: No set 0 found for this 3 add-card rejected.
Meaning: No plant segment (type 0) was found for the set 3 card.
Action: Correct error and resubmit transaction.

Message: No set 1 found for this 3 add - card rejected.
Meaning: Same as above except point source segment (type 1) is missing.
Action: Correct error and resubmit transaction.

Message: Line number invalid - card rejected.
Meaning: Line number (set 3) contains an error.
Action: Correct error and resubmit transaction.

Message: Too many 3 adds with dupe ID info - card rejected.
Meaning: An attempt has been made to add the same half line more than once in the same run.
Action: Correct error and resubmit transaction.

Message: Comment already present - card rejected.
Meaning: If the half of the line is already present, with other than blanks it must be either changed or deleted to put other information in the same half of line.
Action: Correct error and resubmit transaction.

3.2 RETRIEVAL

The ability to retrieve data from the EIS/P&R Master File is provided by the Retrieval Language Processor program and the Retrieval program.

3.2.1 RETRIEVAL LANGUAGE PROCESSOR

The Retrieval Language Processor program generates the actual Retrieval program based on English-like requests entered by the user. These retrieval requests are edited and, if no severe errors are found, the Retrieval program is compiled and executed to extract any data meeting the user's specification. Those records in the Master File which have qualified are placed in a separate Answer File for processing. The records in the Answer File are in the same order and have the same formats as the records in the Master File. The Answer File, therefore, may be used by any program which accepts the Master File for processing. Care should be used, however, as the Answer File is a subset of the Master File. Any changes made to the Answer File will not be necessarily reflected in the Master File. In other words, performing an update on an Answer File will not update the Master File.

Every retrieval request contains two control cards in addition to the retrieval specification. The $$END card signals the end of the request. The $$SELECT card signals the beginning of the request and the type of request. There are three different types of request: EIS/P&R retrieval language specifications, inline COBOL language specifications, and copied COBOL language specifications. An example of these control cards, along with retrieval specifications follows:

```
$$SELECT USER
          QUALIFY-RECORDS.
            IF ESTABLISHMENT IS EQUAL TO ' '        OR
               MAILING-ADDRESS IS EQUAL TO ' '      OR
               (COMMENT-L IS NOT EQUAL TO ' '       AND
               LINE-NO = '001')
               MOVE TRUE TO QUALIFICATION-ACHIEVED-SW.
          QUALIFY-RECORDS-END.
            EXIT.
```

```
         SET-QUALIFICATION-LEVEL SECTION.
          SET-QUAL-LEVEL.
            MOVE REQUIRE-3-QUAL TO QUALIFICATION-REQUIRED.
          SET-QUAL-LEVEL-END.
            EXIT.
$$END
```

Refer to Figure 3.2.1.4-1 for the formats of the $$SELECT and $$END cards.

Retrieval specifications written in the EIS/P&R retrieval language are entered immediately following the $$SELECT card, expressing one relationship per card. For example, A=B expresses a relationship where A is the subject name, = is the relational operator, and B is the object name. Multiple relationships may be expressed by connecting single relationships with a Boolean operator. For example, A=B AND C=D OR E=F expresses three relationships, A=B, C=D, E=F, connected by the Boolean operators AND and OR. The Boolean operator AND signifies that both relationships connected by the AND have to be true for the entire statement to be true. OR indicates that if either relationship is true, the statement is true. Refer to the truth tables below.

X \ Y	T	F
T	T	T
F	T	F

X OR Y

X \ Y	T	F
T	T	T
F	F	F

X AND Y

An example of retrieval specifications using Boolean logic follows:

```
COUNTY          =    '2280'    OR
COUNTY          =    '3120'    AND
POLLUTANT-ID    =    '42401'
```

This will retrieve two cases of records. The first case will be all records with COUNTY = '2280' and POLLUTANT-ID equal to anything. The second case will be those records with both COUNTY = '3120' and POLLUTANT-ID = '42401'.

Refer to Figure 3.2.1.4-2 for the exact format of the EIS/P&R retrieval language specifications.

The subject name field and the object name field may each contain either a valid data name (see Figure 3.2.1.4-3) or a literal enclosed in apostrophes. An invalid data name or missing apostrophes will cause the retrieval to abort. Parentheses may be used for grouping with the following exceptions: the first occurrence of a repeating name from the segment 1 record and the first occurrence of any name from the segment 2 record must not be enclosed in parentheses. After a segment 2 name has been specified, parentheses may be used freely around any other segment 2 names. The similar case is true for names from the repeating portion of the segment 1 record; once one has been specified unenclosed by parentheses, parentheses may then be used freely.

Two further restrictions are applied to repeating names: a repeating name may be preceded by a left parenthesis but may not be followed by a right parenthesis. Also, a repeating name from the segment 1 record may not be specified at any time after a name from the segment 2 record has been specified. This restriction applies only to repeating names. Names from the fixed portion of the segment 1 record may be specified after names from the segment 2 record.

An example of the use of parentheses follows:

```
(COUNTY         =    '2280'        OR
COUNTY          =    '3120')       AND
POLLUTANT-ID    =    '42401'
```

This specification will result in all records being retrieved with COUNTY being '2280' OR '3120', but in both cases POLLUTANT-ID must also be '42401'. Note the difference between this example and the above example for Boolean logic.

An example of incorrect uses of parentheses follows:

```
COUNTY          =     '2280'        OR
(COUNTY         =     '3120'        AND
'42401'         =     POLLUTANT-ID)
```

This example shows two rule restrictions. The first violation is that the first occurrence of a repeating name must not be in parentheses. The second violation is that a repeating name may not be followed by a right parentheses. To achieve the desired result, the parentheses should be removed and POLLUTANT-ID should be on the left side of "=". See the Boolean logic example above.

The negation field must contain the negation character, 'N', or blank. Any other character will result in a warning message. The program will then assume that negation was intended and continue processing.

An invalid relational or Boolean operator will cause the retrieval to abort.

The Boolean operator field may contain blanks or the words AND or OR. Blanks in this field signal the end of the retrieval specification and terminal editing. The program then expects that the next card will be the $$END card. The words AND or OR indicate that another relationship follows and that editing is to continue.

Inline COBOL language specifications are entered immediately following the $$SELECT card. These cards are punched according to COBOL rules for syntax and punctuation. Any user-defined paragraph or section name should begin with the prefix, USER-, to avoid conflict with other names in the program. Any valid PROCEDURE DIVISION statements, with the exception of DECLARATIVES, may be entered. Since the Retrieval Language Processor program does not examine the statements, any errors could result in COBOL diagnostics or unpredictable results.

Copied COBOL language specifications have the same attributes as inline COBOL specifications. However, they are stored externally and are copied in at the time the Retrieval program is compiled.

The name of the load module is LXLNGPRC.

3.2.1.1 ORGANIZATION

The following are the main modules in the Retrieval Language Processor program.

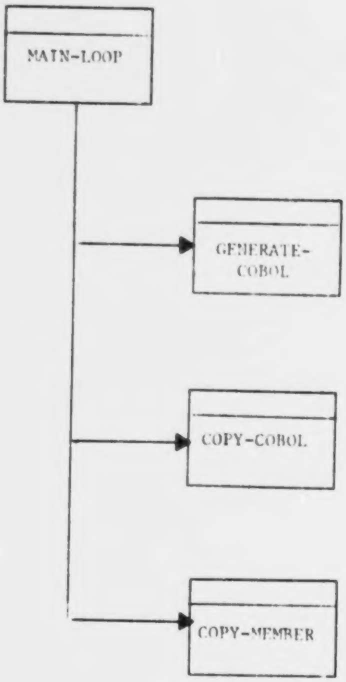
- MAIN-LOOP
  This routine has a conditional branch which branches to GENERATE-COBOL, COPY-COBOL, OR COPY-MEMBER depending on the option entered on the $$SELECT card.

- GENERATE-COBOL
  This routine processes EIS/P&R retrieval language specifications and, after editing, generates the proper COBOL code to perform the retrieval.

- COPY-COBOL
  Inline COBOL language specifications are copied into the Retrieval program skeleton by this routine.

- COPY-MEMBER
  Code to copy an external COBOL member into the Retrieval program skeleton is generated by this routine.

Figure 3.2.1.1 shows the organization of LXLNGPRC.


MAIN-LOOP
GENERATE-COBOL
COPY-COBOL
COPY-MEMBER

LXLNGPRC Organization
Figure 3.2.1.1

3.2.1.2 COMMUNICATION AND DATA FORMATS

The following defines the usage of certain COBOL WORKING-STORAGE names:

- BOOLEAN-SW - May contain '0' (NO-PRECEDING-BOOLEAN), '1' (LAST-BOOLEAN-WAS-OR), or '2' (LAST-BOOLEAN-WAS-AND) depending on the contents of the Boolean operator field of the last control card processed.

- CHECK-REPEATING-NAME-SW - May contain TRUE or FALSE. If true, a search is performed to determine whether or not the current data name identifies a field in the repeating portion of the segment 1 record.

- CHECK-SEG-2-SW - May contain TRUE or FALSE. If true, a search is performed to determine whether or not the current data name identifies a field in the segment 2 record.

- COMPARAND-FOUND-SW - May contain TRUE or FALSE. If true, the comparand (object name) has been validated.

- CONTINUATION-PENDING-SW - May contain TRUE or FALSE. If true, Boolean checks are made and/or an output record is written.

- DATA-NAME-FOUND-SW - May contain TRUE or FALSE. If true, the data name (subject name) has been validated.

- END-CARD-FOUND-SW - May contain TRUE or FALSE. IF true, either the $$END card has been found or an end-of-file has occurred on the Control Card File.

- END-OF-FILE-SW - May contain TRUE or FALSE. If true, a data set end-of-file has been detected or signaled.

- ERROR-FOUND-SW - May contain TRUE or FALSE. If true, an error has been found during editing.

- IF-WRITTEN-SW - May contain TRUE or FALSE. If true, the IF clause has been written to the Retrieval program skeleton.

- PARENS-BALANCED-SW - May contain TRUE or FALSE. If true, the number of left parentheses are equal to the number of right parentheses.

- PREVIOUS-SEGMENT-2-SW - May contain TRUE or FALSE. If true, a segment 2 data name has been encountered.

- QUALIFICATION-REQUIRED - May contain '1' (QUAL-0-REQUIRED), '2' (QUAL-1-REQUIRED), '3' (QUAL-2-REQUIRED), or '4' (QUAL-3-REQUIRED). Identifies the lowest logical level of record which must be present in order for a complete qualification to be performed.

- REPEATING-NAME-SW - May contain TRUE or FALSE. If true, the current data name (subject or object name) is a repeating data name.

- SEGMENT-2-SW - May contain TRUE or FALSE. If true, the current data name (subject or object name) names a field in the segment 2 record.

- TEST-NAME-FOUND-SW - May contain TRUE or FALSE. If true, the current data name (subject or object name) has been successfully matched against the list of valid retrieval names.

3.2.1.3 ROUTINES

The following are major routines of the EIS/P&R Retrieval Language Processor program:

- CHECK-COMPARAND - This routine first performs STRIP-PARENS-C which removes the left and right parentheses from the comparand (object name) and replaces them with blanks. Next SEARCH-TABLE is performed which tests the validity of the name. If the object name was not found in the valid names table, an error message is printed.

- CHECK-DATA-NAME - Similar in function to CHECK-COMPARAND. However, the subject name, rather than the object is examined.

- EDIT-NON-REPEATING-DATA - This routine handles the generation of the Retrieval program up to the point at which a repeating or segment 2 data name is encountered. At that point, another routine is invoked. If a repeating or segment 2 data name is not encountered in the control card stream, this routine retains control until end-of-file on the control card stream.

- EDIT-REPEATING-DATA - This routine handles the generation of the Retrieval program from the point at which a repeating data name is encountered to the point at which a segment 2 data name is encountered in the control stream. If a segment 2 name is not encountered, this routine retains control until end-of-file.

- EDIT-SEGMENT-2 - This routine handles the generation of the Retrieval program from the point at which a segment 2 data name is encountered in the control card stream until end-of-file.

- GEN-ELSE - This routine is invoked whenever an OR Boolean operator unenclosed by parentheses is encountered in the control card stream. It generates an ELSE clause in the Retrieval program.

- GEN-PERFORM-1 - This routine is invoked upon the first occurrence of a repeating data name in the control card stream. It generates a PERFORM clause in the Retrieval program to perform the qualification of the repeating data.

- GEN-PERFORM-2 - This routine is invoked upon the first occurrence of a segment 2 data name. It generates a PERFORM clause in the Retrieval program to perform the qualification of the segment 2 data.

- PROCESS-CONTINUATION - This routine is invoked whenever a continuation is pending (i.e. a Boolean operator has been encountered). It tests for balanced parentheses, and a segment 2 or repeating data name and, based on the results of these tests, generates the correct code in the Retrieval program.

- READ-ROUTINE - This routine reads a control card and prints it.

- SEARCH-FOR-SEG-2-OR-REPEAT - Once a data name has been found in the valid names table, this routine is invoked to determine whether or not it is a repeating or segment 2 data name.

- WRITE-READ-ROUTINE
  This routine writes a record and then performs READ-ROUTINE. It is used for copying inline COBOL language specifications into the Retrieval program.

Retrieval Control Cards

Columns	Format	Symbol	Description
1 - 8	A - A	Alphabetic	Card Type
9			Unused
10 - 13	AAAA	Alphabetic	User Id
14 - 15			Unused
16 - 23	X - X	Alphanumeric	Member Name
24 - 80			Unused

Retrieval Control Cards

Figure 3.2.1.4-1

3.2.1.4-1 DESCRIPTION OF RETRIEVAL CONTROL CARD FIELDS

Card Type: Identifies the card as either a $$SELECT card or a $$END card. The keyword must be left-justified within the field.

User ID: If the keyword USER is entered in this field, it indicates that the retrieval request is in COBOL, rather than in EIS/P&R retrieval language. The keyword, USER, is valid only on the $$SELECT card.

Member Name: Specifies the name of the member in an external source library containing the COBOL retrieval request. This is COBOL code which is valid only in conjunction with the USER option. If blank, indicates that the COBOL code is inline, rather than on a library.

Retrieval Language Specifications

Columns	Format	Symbol	Description
1 - 31	X - X	Alphanumeric	Subject Name
32			Unused
33	A	Alphabetic	Negation Flag
34			Unused
35	X	Special Character	Relational Operator
36			Unused
37 - 67	X - X	Alphanumeric	Object Name
68			Unused
69 - 71	AAA	Alphabetic	Boolean Operator
72 - 80			Unused

Retrieval Language Specifications
Figure 3.2.1.4-2

3.2.1.4-2 DESCRIPTION OF RETRIEVAL LANGUAGE SPECIFICATIONS

Subject Name: The name of a field in the EIS/P&R Master File record whose content is to be tested or a literal (enclosed in apostrophes) to be compared against the value specified by the object name.

Negation Flag: When non-blank, indicates the Boolean NOT condition. Valid codes are N and space.

Relational Operator: Indicates the relationship to be tested between the subject name and the object name. Valid codes are:

= equal
> greater than
< less than

Object Name: The name of a field in the EIS/P&R Master File record whose content is to be tested or a literal (enclosed in apostrophes) to be compared against the value specified by the subject name.

Boolean Operator: Connects a relationship or group of relationships to another relationship or group of relationships. Valid values are AND and OR. AND indicates that both relationships or groups must be true in order for the entire relationship to be true. OR indicates that if either relationship or group is true, the entire relationship is true.

Valid Data Names for Retrieval (Plant Data)

The following list of names from the fixed segment may be referenced in either the EIS/P&R retrieval specification language or in COBOL language specifications.

AQCR
CITY
CONTACT
COUNTY
DATE-OF-0-RECORD
LOCAL-CONTROL
NUMBER-OF-EMPLOYEES
OWNER
PLANT-ID
PRINCIPLE-PRODUCT
PROPERTY-AREA
RECORD-0-DAY
RECORD-0-YEAR
SEG-0-ID
SEG-0-SET-ID
SEGMENT-0-ID
STATE
TELEPHONE
USER-CONTROL-REGION
USER-PLANT-ID
UTM-ZONE

The following two names from the fixed segment may be referenced in a retrieval specification in the COBOL language only.

ESTABLISHMENT
MAILING-ADDRESS

Valid Retrieval Data Names
Figure 3.2.1.4-3

Valid Data Names for Retrieval (Point and Stack Data)

The following list of names from the point source segment may be referenced in either the EIS/P&R retrieval specification language or in COBOL language specifications.

- ANNUAL-THRUPUT
- BOILER-DESIGN-CAPACITY
- COMPLIANCE-SCHEDULE
- COMPLIANCE-STATUS
- COMPLIANCE-STATUS-UPDATE
- CONTROL-REGULATIONS
- DATE-OF-1-RECORD
- DAY-WEEK
- DEC-FEB
- DIAMETER
- ECAP
- FLOW-RATE
- HEIGHT
- HORIZONTAL
- HOURS-DAY
- IPP
- JUN-AUG
- LATITUDE
- LATITUDE-DEGREE
- LATITUDE-MINUTE
- LATITUDE-SECOND
- LONGITUDE
- LONGITUDE-DEGREE
- LONGITUDE-MINUTE
- LONGITUDE-SECOND
- MAR-MAY
- NBR-OF-POLLUTANTS
- NEDS-POINT-ID
- NORMAL-OPERATING
- PLUME
- POINT-ID
- POINTS-PER-STACK
- RECORD-1-DAY
- RECORD-1-YEAR
- REG-1
- REG-2
- REG-3
- SCHEDULE-MONTH
- SCHEDULE-YEAR
- SEG-1-ID
- SEG-1-SET-1-ID
- SEGMENT-1-ID
- SEP-NOV
- SIC
- SPACE-HEAT
- STACK-DATA
- STATUS-DAY
- STATUS-MONTH
- STATUS-YEAR
- TEMPERATURE
- USER-POINT-ID
- UTM-COORDINATES
- VELOCITY
- VERTICAL
- WEEK-YEAR

Valid Retrieval Data Names
Figure 3.2.1.4-3 (continued)

Valid Data Names for Retrieval (Repeating Data)

The following list of names from the repeating portion of the point source segment may be referenced in either the EIS/P&R retrieval specification language or in COBOL language specifications.

ALLOWABLE
CNTL-EQUIP-COST
CONTROL-EQUIPMENT
EMISSION-UNITS
EMISSIONS
EST-CONTROL-EFF
ESTIMATES
ESTIMATION-METHOD
MEASURED
POLLUTANT-ID
PRIMARY-CNTL
SECONDARY-CNTL
TEST-METHOD

Valid Retrieval Data Names
Figure 3.2.1.4-3 (continued)

Valid Data Names for Retrieval (Machine-Process Data)

The following list of names from the machine process segment may be referenced in either the EIS/P&R retrieval specification language or in COBOL language specifications.

ASH-CONTENT
BEC
BEC-ID
BEC-NUMBER
CONFIDENTIALITY
DATE-OF-2-RECORD
EMISSION-FACTOR-SOURCE
FUEL-PROCESS-RATE
FUEL-UNITS
HEAT-CONTENT
MAX-DESIGN-RATE
NUMBER-OF-EF
RECORD-2-YEAR
RECORD-2-DAY
SCC
SCC-I
SCC-II
SCC-III
SCC-IV
SEG-2-ID
SEG-2-SET-1-ID
SEG-2-SET-2-ID
SEGMENT-2-ID
SOURCE-CODE
SOURCE-DESCRIPTION
SULFUR-CONTENT

Valid Retrieval Data Names
Figure 3.2.1.4-3 (continued)

Valid Data Names for Retrieval (P&R Data)

The following list of names from the permits and registration segment may be referenced in either the EIS/P&R retrieval specification language or in COBOL language specifications.

- DATE-OF-3-RECORD
- LINE-NUMBER
- RECORD-3-DAY
- RECORD-3-YEAR
- SEG-3-ID
- SEG-3-SET-1-ID
- SEG-3-SET-3-ID
- SEGMENT-3-ID

The following three names from the permits and registration segment may be referenced in a retrieval specification in the COBOL language only.

- COMMENT-L
- COMMENT-R
- COMMENTS

Valid Retrieval Data Names
Figure 3.2.1.4-3 (continued)

3.2.1.4 DIAGNOSTIC MESSAGES

The following are the diagnostic messages that may be generated during the retrieval language processor phase of retrieval.

Message: Premature end of file on control card - Assuming $$END card.
Meaning: No $$END card is found by end of file.
Action: No action required.

Message: First control card not $$SELECT - Assumed present.
Meaning: $$SELECT card is missing.
Action: No action required.

Message: No control cards in input stream - run aborted.
Meaning: No $$ control cards or retrieval requests are found.
Action: Correct error and resubmit transaction.

Message: Invalid negation character - NOT condition will be assumed.
Meaning: Only an "N" or "blank" is considered a valid entry.
Action: Correct error and resubmit transaction.

Message: Invalid Boolean operator - run aborted.
Meaning: Only "AND", "OR" or blanks are valid Boolean operators.
Action: Correct error and resubmit transaction.

Message: Unexpected input - card ignored - scanning for $$END card.
Meaning: A card has been encountered without a Boolean operator and cards other than $$END follow.
Action: Check retrieval requests for corrections.

Message: Unmatched Boolean operator - run aborted.

Meaning: The last half of the Boolean statement is missing. When AND or OR is used, it must be followed by a new subject.

Action: Correct error and resubmit transaction.

Message: Data name invalid - run aborted.

Meaning: An incorrect field name is used or single quotation marks are missing. Only those field names given in the list in Figure 3.2.1.4-3 or a literal enclosed in apostrophes are valid.

Action: Correct error and resubmit transaction.

Message: Unbalanced parentheses at first occurrence of repeating seg-1 name - aborted.

Message: Unbalanced parentheses at first occurrence of seg-2 name - run aborted.

Meaning: Parentheses may be used for grouping with the following exceptions:

- o The first occurrence of a repeating name (see 13 card and Figure 3.2.1.4-3) from the segment 1 record. Once a segment 1 repeating name has been used without parentheses, parentheses may be used freely.
- o The first occurrence of any name from a segment 2 record must not be enclosed in parentheses. After any segment 2 name is specified without parentheses, parentheses may be used freely.

Action: Correct error and resubmit transaction.

Message: Repeating segment 1 name specified after segment 2 name - run aborted.

Message: Repeating name may not precede right paren.

Meaning: Two further restrictions are applied to repeating names:

- o A segment 1 repeating name may not be specified at any time after a segment 2 name has been specified. This applies only to repeating names. Names from the fixed portion of segment 1 record may be specified after segment 2 names.
- o A repeating name may be preceded by a left parentheses but may not be followed by a right parentheses.

Action: Correct error and resubmit transaction.

3.2.2 RETRIEVAL

The EIS/P&R Retrieval program reads a Master File and, based on user specifications edited by the Retrieval Language Processor program, selects those segments which qualify for inclusion in an Answer File. The Answer File has the same structure and format as the Master File (see Subsection 2.2.1) and the various segments appear in the same order.

For retrieval purposes, a logical record may consist of a fixed segment (type 0 record), point source segments (type 1 records), machine process segments (type 2 records), and permits and registration segments (type 3 records). The fields in the repeating portion of the machine process (type 2) segment (23 card) and the comment fields of the permits and registration (type 3) segment cannot be used as retrieval fields in the retrieval language specifications. If the user writes his own COBOL, the comments fields may be used. The repeating portions of the machine process can never be used as retrieval fields, because without other information they are meaningless.

The contents of the Answer File produced by the Retrieval program will depend upon which segment or segments contain the qualification fields. The following will help illustrate this.

a. Retrieval fields from the fixed segment (type 0). A logical record will be generated for each selected type 0. Any type 1 records accompanying the type 0 record in the Master File will also accompany it in the Answer File as will any accompanying type 2 records. Type 3 records will not accompany the type 0.

b. Retrieval fields from the point source segment (type 1). A logical record will be generated for each type 0 containing a qualifying type 1 record or records. All type 1 records which qualify will accompany the type 0 record to which they are subordinate. Those type 1 records which do not meet the qualification specification will not be included. All type 2 records subordinate to a qualifying type 1 record will also be included in the logical record. Type 3 records will not be included.

c. Retrieval fields from the fixed portion of the machine process segment (type 2).
A logical record will be generated for each type 0 containing a qualifying type 2 record or records. If any record within the machine process segment qualifies, the entire segment is included in the Answer File. The type 1 record to which the qualifying machine process segment is subordinate will also be included. Type 1 records without subordinate qualifying type 2 records will not be included in the Answer File. Type 3 records will not be included.

d. Retrieval fields from the permits and registration segment (type 3).
A logical record will be generated for each type 0 containing a qualifying type 3 record. The type 1 record to which the qualifying type 3 record is subordinate will also be included as will the type 2 record(s) subordinate to that type 1, assuming there are type 2 records which exist on the file. Type 3

records are included in the Answer File only when they are specifically retrieved, unlike other records which may be included for logical completeness, even though not specifically selected. However, if a field from the type 3 record is mentioned in a retrieval specification referencing other segments, type 3 records which do not meet the retrieval specification may be included. For example, the following retrieval specification:

```
$$SELECT
SCC                        =  '91920603'          OR
LINE-NUMBER                =  '095'
$$END
```

will select line number 95 from any permits and registration segment and any machine process segment containing SCC 91920603. Any permits and registration segment on the same logical level (subordinate to the same type 1) as the qualifying type 2's will be included in its entirety, even though it may fail the line number test. Therefore, it is suggested that any retrievals from the permits and registration segment not be combined with retrievals from other segments.

The original Emissions Inventory Subsystem (EIS) was extended to include a permits and registration (P&R) segment so that the EIS user would be able to store, maintain, and retrieve detailed engineering data which is acquired from permit or registration applications. Since permit and registration forms vary significantly from agency to agency, the P&R extension to EIS was developed to allow free form input. This will allow each user to store his P&R data in a form most suitable for his individual use. In fact, since the P&R extension allows free form input, the user can literally use this file segment for storing other types of data and information such as that pertaining to legal activities, surveillance activities, detailed inspection check points and procedures for a plant, an emission point, or a machine process.

In order to do this, it is necessary that the user organize the P&R file structure to accommodate his operation prior to putting data or information into it.

In organizing the P&R segment of your file, recall that each emission point of each plant or facility in your file has from 1 to 99 P&R segments subordinate to it. In turn, each of these 1 to 99 segments has the capability of storing 1 to 999 lines of data or comment. Each of 999 lines can contain 102 characters of comment or data.

You are requested to leave the first P&R segment for each emission point in your file free for future EIS/P&R expansion. This should allow the accommodation of future NEDS modifications such as the addition of a P7 card without having to redesign the EIS file structure. It is imperative that the first P&R segment of each emission point be reserved for this purpose. You might also consider reserving the second segment of each emission point to accommodate any Regional Office unique requirements.

After reserving these first two segments for each emission point, there are 97 segments of 1 to 999 lines remaining subordinate to each emission point. You may choose to designate each P&R segment 3 as being reserved for detailed and general information regarding the plant or facilities. Each segment 4 may be reserved for storing permit application data for its emission point.

Each segment 5 may contain surveillance reports for its emission point. Each segment 6 may be reserved for a detailed history of all legal activities regarding its emission point. Each segment 7 might contain a detailed inspector's guide for its emission point which would contain information such as:

a. Source name and address (office and plant if different)

b. Emission point identification (descriptive as well as alphanumeric)

c. Primary contact at plant

d. Primary contact at emission point if different

e. Name of plant owner, president, manager, etc.

f. Process description

g. Important process facts

h. Raw materials used

i. Products produced

j. Emission point operating cycle if different from plant operating cycle

k. List and description of equipment (process, control, and auxiliary)

1. Emission point monitoring information including normal reading ranges for instruments, meters, gages, and continuous monitoring devices.

Each segment 8 might contain a history of past source test results for its emission point. P&R segments 9, 10, 11, 12, and 13 (subordinate to each emission point) might be used to store data for a machine process similar to that for the emission point in segments 4, 5, 6 7, and 8. The segments 14 through 19 could be used for another machine process which might be subordinate to the emission point. This could then be continued to accommodate all machine processes which are subordinate to an emissions point.

The preceding discussion is only one example of how the user could organize his P&R file. There are undoubtedly many other approaches which would work equally well. Regardless of the approach chosen, please remember to reserve the first two P&R segments which are subordinate to each emission point for future EIS/P&R expansions to accommodate any NEDS changes or unique Regional Office requirements.

There are many possible combinations of retrievals which involve the P&R segments. Some of the types and examples of retrievals which you may want to make are:

a. Retrieval of a group of lines from a single segment subordinate to a point source.

   1. Example:

```
COUNTY            =    '1280'      AND
SEG-3-SET-1-ID    =    '01'        AND
SEG-3-SET-3-ID    =    '01'        AND
LINE-NUMBER       >    '008'       AND
LINE-NUMBER       <    '020'
```

2. Explantion:

This will retrieve lines 9 through 19 of P&R segment 01 of each plant in COUNTY 1280.

b. Retrieval of a group of lines from a single segment subordinate to a point source, but which the user has reserved to apply to a given SCC through the organization mentioned above.

1. Example:

```
COUNTY           =   '1280'     AND
PLANT-ID         =   '0025'     AND
SEG-3-SET-1-ID   =   '05'       AND
SEG-3-SET-3-ID   >   '08'       AND
SEG-3-SET-3-ID   <   '14'       AND
LINE-NUMBER      <   '026'
```

2. Explanation:

This will retrieve the first 25 lines of P&R segments 09 through 13 subordinate to point source 05 of PLANT 0025 in COUNTY 1280.

c. Retrieval of an entire P&R segment subordinate to a point source.

1. Example:

```
COUNTY           =   '1280'     AND
PLANT-ID         =   '0025'     AND
SEG-3-SET-1-ID   =   '02'       AND
SEG-3-SET-3-ID   =   '04'
```

2. Explantion:

This will retrieve all lines of P&R segment 04 subordinate to PLANT 0025 in COUNTY 1280.

d. Retrieval of all P&R segments for a desired plant.

1. Example:

```
COUNTY       =   '1280'     AND
PLANT-ID     =   '0025'     AND
SEG-3-ID     =   '3'
```

2. Explanation:

This will retrieve all lines from all P&R segments subordinate to PLANT '0025' of COUNTY 1280.

3.2.2.1 ORGANIZATION

The following are the main modules of the Retrieval program:

- MAIN-LOOP
  This routine is performed by ROOT-SEGMENT until an end-of-file is detected on the input EIS/P&R Master File. First, BUFFER-PRIMING is performed to build the logical record in core prior to performing the qualification on the record. Next, the QUALIFICATION section is performed which determines whether the logical record meets the qualification specified by the user. If the logical record meets the specification, WRITE-ROUTINE is invoked to write the logical record to the Answer File.

- BUFFER-PRIMING
  This routine reads segments from the Master File and builds a logical record in core. This record is made as complete as the data in the Master File will allow. Information is added to the logical record until a control break is detected. A control break occurs for one of the following reasons:

  a. End-of-file on Master File
  b. Segment 3 record
  c. Hierarchical level lower than that expected (expecting a type 2, received a type 1, etc.)

  BUFFER-PRIMING will set switches to communicate to the

QUALIFICATION section which segments are present in the logical record.

- QUALIFICATION

  This section performs the tests necessary to determine whether the logical record meets the qualification specifications. It is generated by the Retrieval Language Processor program from retrieval language specifications or from COBOL language specifications. If the specification is entered by the user in COBOL, any paragraph names should start with the prefix USER- to prevent conflicts with other paragraphs in the program. Also, it is the user's responsibility to provide the following code in his COBOL specification:

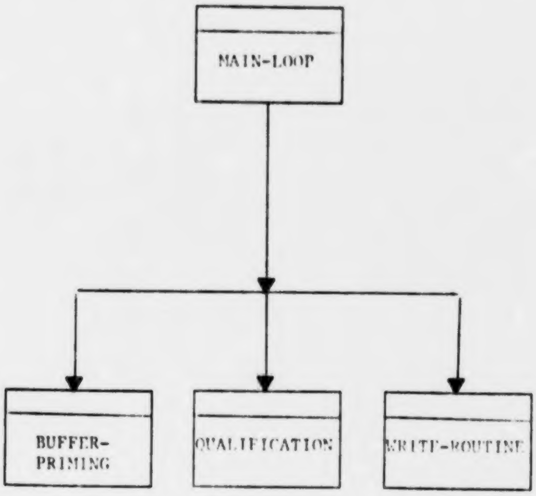
```
SET-QUALIFICATION-LEVEL SECTION.
 SET-QUAL-LEVEL.
   MOVE REQUIRE-n-QUAL to QUALIFICATION-REQUIRED.
 SET-QUAL-LEVEL-END.
   EXIT.
```

  where n is the number of the lowest hierarchical level required to complete the qualification. This code must appear at the end of the COBOL specification. However, prior to the above code in the user's COBOL, the user must also MOVE TRUE TO QUALIFICATION-ACHIEVED-SW when the record has successfully qualified.

- WRITE-ROUTINE

  This routine determines which segments of the logical record should be written to the Answer File. It is not invoked unless the logical record has passed qualification.

Figure 3.2.2.1 illustrates the organization of the Retrieval program.


MAIN-LOOP
BUFFER-PRIMING
QUALIFICATION
WRITE-ROUTINE

RETRIEVER Organization
Figure 3.2.2.1

3.2.2.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the Retrieval program.

- END-OF-FILE-SW - May contain TRUE or FALSE. If true, an end-of-file has been detected on the EIS/P&R Master File.

- QUALIFICATION-ACHIEVED-SW - May contain TRUE or FALSE. If true, the logical record has passed qualification.

- QUALIFICATION-ATTEMPTED-SW - May contain TRUE or FALSE. If false, qualification has not yet been attempted on the current logical record.

- QUALIFICATION-REQUIRED - May contain one of the following values:

  REQUIRE-0-QUAL
  REQUIRE-1-QUAL
  REQUIRE-2-QUAL
  REQUIRE-3-QUAL

  which defines the lowest hierarchical level in the logical record required for qualification.

- READ-SUPPRESSED-SW - May contain TRUE or FALSE. If true, a new record will not be read from the Master File until the switch is set to FALSE.

- RECORD-IN-CORE - May contain one of the following values:

  RECORD-0-IN-CORE
  RECORD-1-IN-CORE

RECORD-2-IN-CORE
RECORD-3-IN-CORE

which indicate the lowest hierarchical level contained in the current logical record. The value in this field must be greater than or equal to the value of QUALIFICATION-REQUIRED in order for qualification to be attempted.

- RECORD-0-WRITTEN-SW - May contain TRUE or FALSE. If true, the 0 segment from the current logical record has been written to the Answer File.

- RECORD-1-WRITTEN-SW - May contain TRUE or FALSE. If true, the 1 segment from the current logical record has been written to the Answer File.

- RECORD-2-WRITTEN-SW - May contain TRUE or FALSE. If true, the 2 segment from the current logical record has been written to the Answer File.

- MSTR-REC-0 - Contains the 0 segment of the current logical record.

- MSTR-REC-1 - Contains the 1 segment of the current logical record.

- MSTR-REC-2 - Contains each record in the 2 segment for qualification purposes. The entire segment is stored elsewhere and moved into this area a record at a time.

- MSTR-REC-3 - Contains a record from a 3 segment for qualification purposes. Each segment is read into core a record at a time.

- SAVE-ALL-SET2 - Contains the 2 segment of the current logical record.

3.2.2.3 ROUTINES

The following are internal subordinates of the Retrieval program.

- READ-ROUTINE
  This routine reads the next physical record from the EIS/P&R Master File.

- SEGMENT-2
  This routine saves each record making up a 2 segment in SAVE-ALL-SET2.

- WRITE-SET-2
  This routine writes each record making up a 2 segment from SAVE-ALL-SET2 to the Answer File.

- WRITE-SET-3
  This routine controls the writing of 3 segment records to the Answer File.

3.2.2.4 DIAGNOSTIC MESSAGES

The following are the diagnostic messages that may be generated during the execution of the retriever.

Message: Master File contains no records.
Meaning: The Master File input to the retriever is not good or is a null file.
Action: Check Master File and input a valid Master File.

Message: Answer File contains no records.
Meaning: The retriever has found no records on the Master File which qualified for retrieval.
Action: Check for a valid Master File or check the retrieval specifications for validity if retrieval was expected.

Message: Unknown record type found -- record ignored.
Meaning: A record type other than 0, 1, 2, 3 was found.
Action: Check for error on Master File as indicated by accompanying message.

Message: KEY = XXXXXXXXXXXXX DATE = XXXXX, SEG-ID = XXX.
Meaning: This message in conjunction with above message will give information to identify bad record.
Action: Use information to locate record.

4.0 OUTPUT PROGRAMS

There are five output programs in the EIS/P&R system, each producing a different form of output. These five are the File List, Summary Report, NEDS Point Source, NEDS Area Source, and NEDS Area Source Report output programs.

4.1 FILE LIST

This program produces a detail listing of the EIS/P&R Master File. The Master File is listed with one point source record and its corresponding machine process records per page. Following each point source page, the corresponding permits and registration records are listed with one set of records per page. If a single plant has more than one point source or more than one set of permits and registration records, the plant/location information is repeated for each point source page and each permits and registration set page. If area source data is in the same file as point source, the point source data should be selected by the use of the EIS/P&R retrieval capability (USER-PLANT-ID N = 'AREA SOURCE').

This program can also be used to print a detail listing of all of the retrieval answer files. It will list the area source records, but the file headings will be meaningless.

Figure 4.1 illustrates selected page examples from File Maintenance Run 6 of the EIS/P&R Test package.

```
      STATE COUNTY AQCR PLANT ID
        19   1280   067   0010                                                                          PAGE    1

  DATE       SEGMENT    CONTROL  LOCAL
YEAR DAY       ID       REGION   CONTROL    PLANT ID                                                   PRINCIPAL
 72  000      000                                      CITY UTM ZONE OWNER    CONTACT       TELEPHONE   PRODUCT
                                                       1880    15      F   B.Z. LIGHT T

                                                                NUMBER OF  PROPERTY
ESTABLISHMENT NAME AND ADDRESS                         ZIP     EMPLOYEES    AREA     MAILING ADDRESS
IOWA GAS AND LIGHT CO.                                                     00000.0                                    ZIP
```

File List Examples
File Maintenance Test 6 of EIS/P&R Test Package
Figure 4.1

```
         STATE COUNTY AQCR PLANT ID                                                                    PAGE     2
           19   1280   067   0025

  DATE     SEGMENT   CONTROL  LOCAL                                                                  PRINCIPAL
YEAR DAY      ID     REGION   CONTROL    PLANT ID    CITY UTM ZONE OWNER      CONTACT       TELEPHONE   PRODUCT
 72  000     000                                     0480    15       F   D.B. DUCK  P

                                                        NUMBER OF  PROPERTY
ESTABLISHMENT NAME AND ADDRESS                  ZIP     EMPLOYEES    AREA     MAILING ADDRESS                           ZIP
WATT POWER CO.                                                     00000.0

  DATE   SEGMENT POINT ID                    UTM COORDINATES    LATITUDE     LONGITUDE    ANNUAL THRUPUT   NORMAL OPERATING
YEAR DAY   ID     NEDS USER   SIC  IPP HORIZONTAL VERTICAL DEG MIN SEC  DEG MIN SEC  DEC MAR JUN SEP  HR/D D/WK WK/YR
 73  051   101     01        0000 00     000.0     0000.0                             24  22  28  26   24   7    50

BOILER   SPACE  S     T    A    C     K          D    A    T    A        COMP SCHED   COMP STATUS          CONTROL REGULATION
CAPACITY HEAT   HEIGHT DIAM TEMP FLOW RATE VELOCITY PLUME PNTS  COMP YEAR MONTH  YEAR MONTH DAY  ECAP REG 1 REG 2 REG 3
 02010    00.0   0306  11.8 0305  0049675            0000             00    00    00   00    00

NUMBER OF   POLLUTANT CONTROL    CONTROL EQUIP  ESTM CNTL       E M I S S I O N S               ESTIMATE  TEST
POLLUTANTS     ID       COST       PRI    SEC   EFFICIENCY  ESTIMATE MEASURED ALLOWABLE UNITS  METHOD   METHOD
    05       42101                 060    000      00.0     0000000           0000000             0
             43101                 060    000      00.0     0000000           0000000             0
             42602                 060    000      00.0     0000000  0010101  0000000             0
             42401                 060    000      00.0     0565679           0000000             3
             11101                 010    000      98.0     0006788           0000007             3

  DATE   SEGMENT       SCC          BEC              FUEL -   MAX DESIGN  SULFUR    ASH     HEAT
YEAR DAY   ID    I II III IV NBR ID  UNITS PROCESS     RATE     CONTENT CONTENT CONTENT CONF SOURCE
 73  004 2 01 05 2 02 002 00                0497300              3.00     09.1   00020    2    B

                                 E F    NUMBER OF  POLLUTANT EMISSION   ASH /  FACTOR
SOURCE DESCRIPTION              SOURCE  EMSN FCTR     ID       FACTOR    SULFUR  UNITS
                                  A        05        42101   000550.000    U       0
                                                     43101   000450.000    U       0
                                                     42602   000350.000    U       0
                                                     42401   000250.000    A       U
                                                     11101   000150.000    A       U
```

File List Examples
File Maintenance Test 6 of EIS/P&R TEST Package
Figure 4.1 (continued)

Reproduced from best available copy.

```
       STATE COUNTY AQCR PLANT ID                                                                              PAGE    3
        19    1280   067   0025

SEGMENT ID
  3 01 01

 DATE      LINE                                       COMMENT
YEAR DAY  NUMBER
 74   200    001                               ENVIRONMENTAL PROTECTION
 74   200    002                                        AGENCY
 74   200    003                                 (40 CFR, PART 60)
 74   200    004                        STANDARDS OF PERFORMANCE FOR NEW
 74   200    005                                STATIONARY SOURCES
 74   200    006                        PROPOSED STANDARDS FOR SEVEN SOURCE
 74   200    007                                    CATEGORIES
 74   200    008                                                                                     MAY 4, 1973.
 74   200    009    PURSUANT TO SECTION 111 OF THE CLEAN AIR ACT, THEADMINISTRATOR PROPOSES HEREIN STANDARDS OF
 74   200    010   PERFORMANCE FOR NEW AND MODIFIED SOURCES WITHIN SEVEN CATEGORIES OF STATIONARY SOURCES: ASPHALT
 74   200    011   CONCRETE PLANTS, PETROLEUM REFINERIES, STORAGE VESSELS FOR PETROLEUM LIQUIDS, SECONDARY LEAD SMELTERS,
 74   200    012   SECONDARY BRASS AND BRONZE INGOT PRODUCTION PLANTS, AND SEWAGE TREATMENT PLANTS. THE ADMINISTRATOR
 74   200    013   ALSO PROPOSES AMENDMENTS TO THE GENERAL PROVISIONS OF 40 CFR, PART 60, PUBLISHED ON DECEMBER 23, 1971
 74   200    014   (36 FR 24876), AND TO THE APPENDIX, ''TEST METHODS,'' TO THIS PART. IN A SEPARATE PUBLICATION, ON
 74   200    015   MAY 2, 1973 (38 FR 10820), THE ADMINISTRATOR PROPOSED AMENDMENTS TO THE GENERAL PROVISIONS TO
 74   200    016   PRESCRIBE PROCEDURES FOR DEALING WITH EMISSIONS WHICH EXCEED STANDARDS DURING STARTUPS, SHUTDOWNS, OR
 74   200    017   MALFUNCTIONS. THE GENERAL PROVISIONS APPLY TO ALL STANDARDS OF PERFORMANCE FOR NEW OR MODIFIED
 74   200    018   SOURCES, BOTH THOSE STANDARDS PROMULGATED TO DATE (36 FR 24876) AND THOSE TO BE PROMULGATED IN THE
 74   200    019   FUTURE.
 74   200    020    AS PRESCRIBED BY SECTION 111, THIS PROPOSAL OF STANDARDS WAS PRECEDED BY THE ADMINISTRATOR'S
 74   200    021   DETERMINATION THAT THESE SEVEN CATEGORIES OF SOURCES CONTRIBUTE SIGNIFICANTLY TO AIR POLLUTION WHICH
 74   200    022   CAUSES OR CONTRIBUTES TO THE ENDANGERMENT OF PUBLIC HEALTH OR WELFARE AND BY HIS PUBLICATION OF A LIST
 74   200    023   OF THESE CATEGORIES OF SOURCES IN THIS ISSUE OF THE FEDERAL REGISTER.
 74   200    024    THE PROPOSED STANDARDS APPLY TO A SELECTED SOURCE OR SOURCES WITHIN EACH CATEGORY AND TO SELECTED
 74   200    025   AIR POLLUTANTS. FOR EXAMPLE, THE STANDARD PERTINENT TO IRON AND STEEL PLANTS APPLIES TO THE EMISSION
 74   200    026   OF PARTICULATE MATTER FROM BASIC OXYGEN PROCESS FURNACES.
 74   200    027    THE BASIS FOR THE PROPOSED STANDARDS INCLUDE THE RESULTS OF SOURCE TESTS CONDUCTED BY THE
 74   200    028   ENVIRONMENTAL PROTECTION AGENCY AND LOCAL AGENCIES, DATA DERIVED FROM AVAILABLE TECHNICAL LITERATURE,
 74   200    029   INFORMATION GATHERED DURING VISITS TO POLLUTION CONTROL AGENCIES AND PLANTS IN THE UNITED STATES AND
 74   200    030   ABROAD, AND COMMENTS AND SUGGESTIONS SOLICITED FROM EXPERTS. IN EACH CASE, THE PROPOSED STANDARD
 74   200    031   REFLECTS THE DEGREE-OF-EMMISSION LIMITATION ACHIEVABLE THROUGH THE APPLICATION OF THE BEST SYSTEM OF
 74   200    032   EMMISSION REDUCTION WHICH TAKING INTO ACCOUNT THE COST OF ACHIEVING SUCH REDUCTION, THE ADMINISTRATOR
 74   200    033   HAS DETERMINED HAS BEEN ADEQUATELY DEMONSTRATED. BACKGROUND INFORMATION WHICH PRESENTS THE FACTORS
 74   200    034   CONSIDERED IN ARRIVING AT THE PROPOSED STANDARDS INCLUDING COSTS AND SUMMARIES OF TEST DATA, IS
 74   200    035   AVAILABLE FREE OF CHARGE FROM EMISSION STANDARDS AND ENGINEERING DIVISION, ENVIRONMENTAL PROTECTION
 74   200    036   AGENCY, RESEARCH TRIANGLE PARK, N.C. 27711, ATTENTION: MR. DON R. GOODWIN. IT IS EMPHASIZED THAT THE
 74   200    037   COSTS ARE CONSIDERED REASONABLE FOR NEW AND SUBSTANTIALLY MODIFIED SOURCES AND THAT IT IS NOT IMPLIED
 74   200    038   THAT THE SAME COSTS APPLY TO THE RETROFITTING OF EXISTING SOURCES. RETROFITTING EXISTING SOURCES TO
 74   200    039   ACHIEVE THE PROPOSED EMISSION LIMITATIONS WOULD IN SOME CASES COST MUCH MORE.
 74   200    040    THE ENVIRONMENTAL PROTECTION AGENCY HAS ADOPTED A POLICY OF EXPRESSING STANDARDS IN THE METRIC
 74   200    041   RATHER THAN ENGLISH SYSTEM. ALTHOUGH TECHNICAL TERM IN TEST METHODS 10 AND 11 ARE EXPRESSED IN METRIC
 74   200    042   UNITS, MANY OF THOSE IN TEST METHODS 1 THROUGH 9 ARE EXPRESSED IN ENGLISH UNITS. TEST RESULTS DERIVED
 74   200    043   THROUGH CALCULATIONS IN TEST METHODS 1 THROUGH 9 MUST BE CONVERTED TO METRIC UNITS TO AGREE WITH THE
 74   200    044   FORM OF THE PROPOSED STANDARDS.
 74   200    045    OF SPECIAL INTEREST ARE THE REGULATIONS CONCERNING HYDROCARBON EMISSIONS FROM STORAGE VESSELS FOR
```

File List Examples
File Maintenance Test 6 of EIS/P&R Test Package
Figure 4.1 (continued)

```
      STATE COUNTY AQCR PLANT ID                                                                                PAGE    4
        19   1280   067   0025

SEGMENT ID
  3 01 01

  DATE    LINE                                             COMMENT
YEAR DAY NUMBER
 74  200   046    PETROLEUM LIQUIDS (SUBPT. K), AND THE ALLOWABLE LEVEL OF PARTICULATE EMISSIONS FROM ASPHALT BATCH
 74  200   047    PLANTS (SUBPT. I).
 74  200   048      AS EXPLAINED IN TECHNICAL REPORT 9, EMISSIONS OF HYDROCARBONS FROM STORAGE VESSELS FOR PETROLEUM
 74  200   049    LIQUIDS ARE SIGNIFICANT. MOST OF THE HYDROCARBON EMISSIONS ARE RELEASED DURING STORAGE AND DURING TANK
 74  200   050    FILLING. RATES OF EMISSIONS ARE DEPENDENT ON A VARIETY OF FACTORS SUCH AS THE PHYSICAL PROPERTIES OF
 74  200   051    THE LIQUID BEING STORED, CLIMATIC AND METEOROLOGICAL CONDITIONS, AND THE SIZE, TYPE, COLOR, AND
 74  200   052    CONDITION OF THE TANK.
```

File List Examples
File Maintenance Test 6 of EIS/P&R Test Package
Figure 4.1 (continued)

```
          STATE COUNTY AQCR PLANT ID
            19   1260   067   0060                                                                           PAGE     5

  DATE       SEGMENT   CONTROL  LOCAL                                                                      PRINCIPAL
YEAR DAY       ID      REGION   CONTROL   PLANT ID    CITY UTM ZONE OWNER     CONTACT       TELEPHONE    PRODUCT
 72  000      000                                     1260    15      F   E.E.ELECTRIC

                                                     NUMBER OF  PROPERTY
ESTABLISHMENT NAME AND ADDRESS              ZIP      EMPLOYEES    AREA     MAILING ADDRESS                                  ZIP
SHOCKING POWER CO.                                               00000.0

 DATE    SEGMENT POINT ID                  UTM COORDINATES   LATITUDE     LONGITUDE   ANNUAL THRUPUT    NORMAL OPERATING
YEAR DAY    ID     NEDS USER  SIC  IPP HORIZONTAL VERTICAL DEG MIN SEC  DEG MIN SEC  DEC MAR JUN SEP  HR/D D/WK WK/YR
 72  000   101     01         0000 00    000.0    0000.0                             00  22  55  23    24    7    45

BOILER   SPACE  S     T    A    C    K          D    A    T    A         COMP SCHED   COMP STATUS          CONTROL REGULATION
CAPACITY HEAT   HEIGHT DIAM TEMP FLOW RATE VELOCITY PLUME PNTS  COMP YEAR MONTH  YEAR MONTH DAY  ECAP REG 1 REG 2 REG 3
 00572    00.0   0123  07.6 0320  0183000            0000              00    00     00   00    00

NUMBER OF    POLLUTANT CONTROL   CONTROL EQUIP  ESTM CNTL          E M I S S I O N S                 ESTIMATE  TEST
POLLUTANTS      ID       COST      PRI   SEC    EFFICIENCY  ESTIMATE MEASURED ALLOWABLE UNITS  METHOD   METHOD
   05         42602                060   000       00.0      0000000          0000000             0
              42401                060   000       00.0      0022694          0000000             3
              11101                009   000       65.0      0003971          0000000             3
              42101                060   000       00.0      0000000          0000000             0
              43101                060   000       00.0      0000000          0000000             0
  DATE   SEGMENT      SCC         BEC          FUEL -   MAX DESIGN  SULFUR    ASH     HEAT
YEAR DAY   ID     I II III IV NBR ID  UNITS PROCESS     RATE     CONTENT CONTENT CONTENT CONF SOURCE
 72  000 2 01 05 2 02 002 01                 0069320                 3.15    10.5    00023    2    B

                              E F    NUMBER OF  POLLUTANT EMISSION    ASH /  FACTOR
SOURCE DESCRIPTION           SOURCE  EMSN FCTR     ID       FACTOR    SULFUR  UNITS
                                A       05        42401  000200.000     S       U
                                                  11101  000100.000     S       U
                                                  42101  000500.000     S       U
                                                  43101  000400.000     S       U
                                                  42602  000300.000     S       U
  DATE   SEGMENT      SCC         BEC          FUEL -   MAX DESIGN  SULFUR    ASH     HEAT
YEAR DAY   ID     I II III IV NBR ID  UNITS PROCESS     RATE     CONTENT CONTENT CONTENT CONF SOURCE
 72  000 2 01 10 2 02 006 01                 0001354                 6.34    00.0    00999    2    B

                              E F    NUMBER OF  POLLUTANT EMISSION    ASH /  FACTOR
SOURCE DESCRIPTION           SOURCE  EMSN FCTR     ID       FACTOR    SULFUR  UNITS
                                A       05        11101  000100.000     S       U
                                                  42101  000500.000     S       U
                                                  43101  000400.000     S       U
                                                  42602  000300.000     S       U
                                                  42401  000200.000     S       U
```

File List Examples
File Maintenance Test 6 of EIS/P&R Test Package
Figure 4.1 (continued)

```
         STATE COUNTY AQCR PLANT ID                                                                      PAGE    10
            19   1280   067   0060

  DATE     SEGMENT   CONTROL  LOCAL                                                                    PRINCIPAL
YEAR DAY      ID      REGION   CONTROL   PLANT ID    CITY UTM ZONE OWNER    CONTACT        TELEPHONE    PRODUCT
 72  000     000                                     1260    15      F   E.Z.ELECTRIC

                                                   NUMBER OF  PROPERTY
ESTABLISHMENT NAME AND ADDRESS             ZIP     EMPLOYEES    AREA     MAILING ADDRESS                            ZIP
SHOCKING POWER CO.                                            00000.0

  DATE   SEGMENT POINT ID                      UTM COORDINATES   LATITUDE     LONGITUDE   ANNUAL THRUPUT   NORMAL OPERATING
YEAR DAY    ID   NEDS USER  SIC  IPP HORIZONTAL VERTICAL DEG MIN SEC  DEG MIN SEC  DEC MAR JUN SEP  HR/D D/WK WK/YR
 74  200    110   01        0000 00    000.0     0000.0                             24  22  28  26   24    7    50

BOILER   SPACE   S    T    A    C    K         D    A    T    A      COMP SCHED   COMP STATUS         CONTROL REGULATION
CAPACITY HEAT   HEIGHT DIAM TEMP FLOW RATE VELOCITY PLUME FNIS  COMP YEAR MONTH  YEAR MONTH DAY  ECAP REG 1 REG 2 REG 3
 02010    00.0   0306  11.8 0305  0649675            0000                00    00     00   00    00

NUMBER OF    POLLUTANT CONTROL   CONTROL EQUIP  ESTM CNTL         E M I S S I O N S            ESTIMATE  TEST
POLLUTANTS      ID      COST      EMI   SEC     EFFICIENCY  ESTIMATE MEASURED ALLOWABLE UNITS  METHOD    METHOD
    05         42401              060   000        00.0     0565679            0000000            3
               42602              060   000        00.0     0000000  0010101   0000000            0
               43101              060   000        00.0     0000000            0000000            0
               42101              060   000        00.0     0000000            0000000            0
               11101              010   000        98.0     0005748            0000007            3

  DATE   SEGMENT      SCC       BEC         FUEL -   MAX DESIGN  SULFUR    ASH    HEAT
YEAR DAY    ID    I II III IV NBR ID  UNITS PROCESS    RATE      CONTENT CONTENT CONTENT CONF SOURCE
 74  200 2 10 05 2 02 002 00                0497300               3.00    09.1    00020    2    B

                          E F    NUMBER OF   POLLUTANT EMISSION   ASH /  FACTOR
SOURCE DESCRIPTION       SOURCE  EMSN FCTR    ID        FACTOR    SULFUR  UNITS
                            A        05       42101    000550.000     U      0
                                              11101    000150.000     A      U
                                              42401    000250.000     A      U
                                              42602    000350.000     U      0
                                              43101    000450.000     U      0
```

File List Examples
File Maintenance Test 6 of EIS/P&R Test Package
Figure 4.1 (continued)

```
       STATE COUNTY AQCR PLANT ID                                                                                PAGE    11
         19   1280   067   0060

SEGMENT ID
  3 10 01

 DATE     LINE                                              COMMENT
YEAR DAY NUMBER
 74  200   001                                    STANDARD FOR SULFUR DIOXIDE
 74  200   002                 PARAGRAPH TO BE INSERTED
```

File List Examples
File Maintenance Test 6 of EIS/P&R Test Package
Figure 4.1 (continued)

4.1.1 ORGANIZATION

The following are the main modules of the File List program:

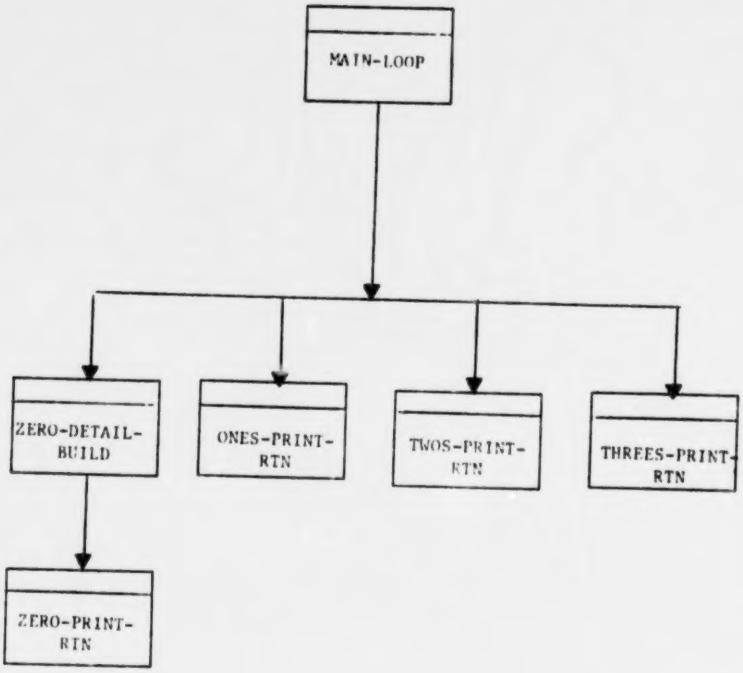
- MAIN-LOOP

  This routine is performed by the ROOT-SEGMENT until the end of file on the Master File is reached. This routine determines the record type and performs the appropriate subroutine to print that record type.

- STAT-PRINT

  This routine formats and prints the record counts for each type of record printed.

Figure 4.1.1 illustrates the organization of PXFILPRT.


MAIN-LOOP
ZERO-DETAIL-BUILD
ONES-PRINT-RTN
TWOS-PRINT-RTN
THREES-PRINT-RTN
ZERO-PRINT-RTN

PXFILPRT Organization
Figure 4.1.1

4.1.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE fields are the major control flags internal to File List.

- ZERO-PRINT-SWITCH - Used by the MAIN-LOOP subroutine to determine if a zero record has been printed for the current one record (ZERO-PRINT-SWITCH = 1) or if the zero record has yet to be printed (ZERO-PRINT-SWITCH = 0).

- EOF-SWITCH - Used by the ROOT-SEGMENT to determine if any of the subroutines have read the last record on the Master File (EOF-SWITCH = 1).

4.1.3 ROUTINES

The following are internal subroutines of the File Print program.

- ZERO-DETAIL-BUILD
  Formats the information from the plant segment.

- ZERO-PRINT-RTN
  Outputs the information from the plant segment.

- ONES-PRINT-RTN
  Formats and outputs the information from the point source segment.

- TWOS-PRINTS-RTN
  Formats and outputs the information from the machine process segment.

- THREES-PRINT-RTN
  Formats and outputs the information from the permits and registration segment.

4.1.4 DIAGNOSTIC MESSAGES

There are no diagnostics generated by this program.

4.2 SUMMARY REPORT

The EIS/P&R Summary capability is intended to be a tool for Air Pollution Control Agencies. It is used with the EIS/P&R Master File Sorter capability; i.e., the Master File Sorter program will select data and sort it in order to produce the summary.

The following data values are summed:

1 - Source Count - This is a sum of sources emitting a pollutant.
2 - Estimated Emissions - This is a sum of estimated emissions.
3 - Actual Emissions - This is a sum of actual (measured) emissions.
4 - Allowable Emissions - This is a sum of allowable (standard) emissions.
5 - Control Equipment Cost - This is a sum of the cost for the control equipment.

A grand total will be provided only for Control Equipment Cost. A number (any combination of any five data fields in the point and stack data) of summaries can be produced. There can be from one to five levels of totals. These are specified by supplying simple MOVE statements.

Example:

```
MOVE AQCR TO BREAK-ONE
```

The field to be summed is moved into a system control field. There are five such control fields, each corresponding to the five levels of totals. The control fields are:

BREAK-ONE	Lowest level of total
BREAK-TWO	Next higher level
BREAK-THREE	Next higher level
BREAK-FOUR	Next higher level
BREAK-FIVE	Highest level of total

The data must be sorted to correspond to the Summary being produced. This is accomplished by executing the EIS/P&R Master File Sorter capability to produce the Summary input data. Note that because emissions are by pollutant, one of the sorts must be pollutant identification to produce a meaningful summary.*

- o Example:

  To produce a summary of emissions by SIC within a county, the following sort and summary statements must be provided by the user.

<u>Master File Sorter</u>

```
$$SORT
SIC                       A
COUNTY                    A
POLLUTANT-ID              A
$$END
```

(Major to Minor)

<u>Summary</u>

```
MOVE MSTR-POLLUTION-ID (EM-SET-INDEX) TO BREAK-ONE.
MOVE MSTR-COUNTY TO BREAK-TWO.
MOVE MSTR-SIC TO BREAK-THREE.
```

- o Example 2:

  To produce a summary of emissions by PLANT within SIC within CITY within COUNTY, the following sort and summary statements must be provided.

---

* The only meaningful summary totals are those at the POLLUTION-ID level. If all of the data items are for the same pollutant, then all totals are meaningful. If two or more pollutants have been selected, only the totals up to the level for POLLUTION-ID are meaningful. For example, if POLLUTION-ID were at BREAK-THREE level, BREAK-ONE, BREAK-TWO, and BREAK-THREE level sums would be meaningful, but BREAK-FOUR and BREAK-FIVE sums would not be meaningful.

Master File Sorter

```
$$SORT
COUNTY              A
CITY                A
SIC                 A
PLANT               A
POLLUTANT-ID        A
$$END
```

Summary

```
MOVE MSTR-POLLUTION-ID (EM-SET-INDEX) to BREAK-ONE.
MOVE MSTR-PLANT TO BREAK-TWO.
MOVE MSTR-SIC TO BREAK-THREE.
MOVE MSTR-CITY TO BREAK-FOUR.
MOVE MSTR-COUNTY TO BREAK-FIVE.
```

The summary report can be personalized, i.e., certain page header and column header information can be provided by the user. This information is provided on control cards. The information can be changed each time the summary is executed.

Control cards for providing information to the summary report are described below.

Card 1

Cols	Content	Default
1-3	OP1	
6-37	Line 1 of Report Title	EMISSIONS INVENTORY SYSTEM
38-69	Line 2 of Report Title	STANDARD SUMMARY OUTPUT
71-78	Date	

Card 2

Cols	Content	Default
1-3	OP2	
6-37	From Organization	AIR POLLUTION CONTROL AGENCY
38-69	To Organization	INFORMATION

Card 3

Cols	Content	Default
1-3	OP3	
6-13	Part 1 of Column 1 Header	BREAK
14-21	Part 2 of Column 1 Header	FIVE
22-29	Part 1 of Column 2 Header	BREAK
30-37	Part 2 of Column 2 Header	FOUR
38-45	Part 1 of Column 3 Header	BREAK
46-53	Part 2 of Column 3 Header	THREE
54-61	Part 1 of Column 4 Header	BREAK
62-69	Part 2 of Column 4 Header	TWO

Card 4

Cols	Content	Default
1-3	OP4	
6-13	Part 1 of Column 5 Header	BREAK
14-21	Part 2 of Column 5 Header	ONE

The summary Report Control Cards are used to "personalize" this report. The report header defaults as follows:

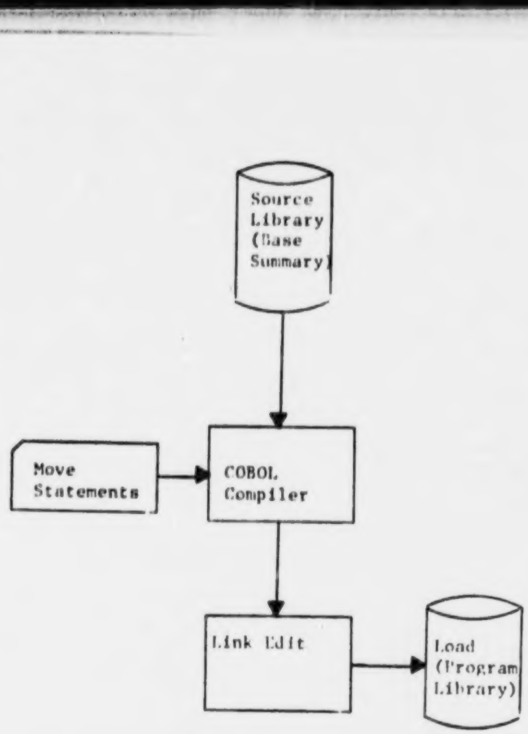
```
                    AIR POLLUTANT EMISSIONS SUMMARY
EMISSIONS INVENTORY SYSTEM          FROM AIR POLLUTION CONTROL AGENCY
STANDARD SUMMARY OUTPUT             TO INFORMATION
BREAK BREAK BREAK BREAK BREAK
FIVE  FOUR  THREE TWO   ONE
```

The summary statements (MOVE) are actually compiled into a program and executed. It is this program which reads the control cards (if any) and produces the summary report.

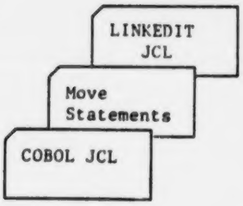
A summary program can be temporary (for adhoc reports) or permanent (for standard reports); i.e., the program can be compiled, used, and deleted from the system or it can be compiled and stored on a library to be used over and over again. These options are illustrated by Figures 4.2-1 through 4.2-3.

Figure 4.2-4 illustrates an example of a Summary Report and its corresponding specifications. This example is taken from AD HOC Run 1 of the EIS/P&R Test Package.

Data Flow


Source Library (Base Summary)
Move Statements
COBOL Compiler
Link Edit
Load (Program Library)

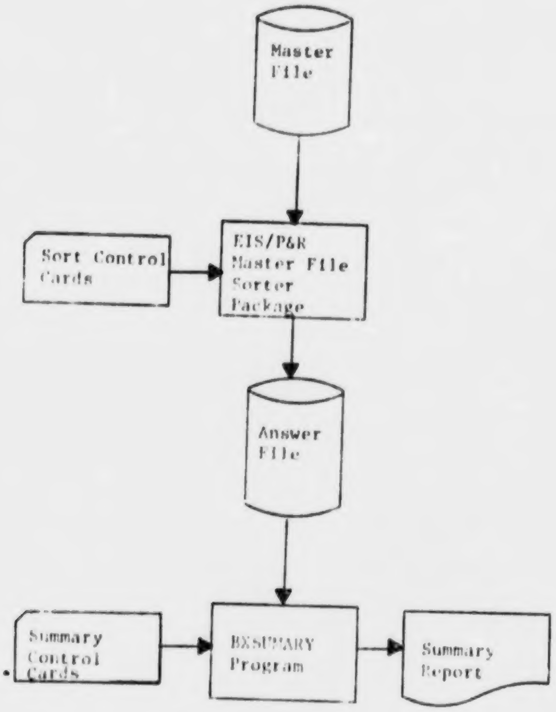
Deck


LINKEDIT JCL
Move Statements
COBOL JCL

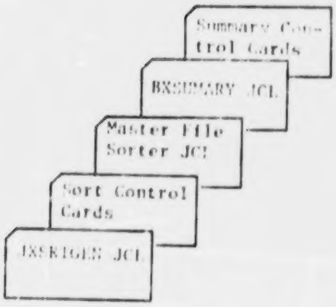
(including member name for Load Library)

PERMANENT SUMMARY REPORT GENERATION
Figure 4.2-1

Data Flow

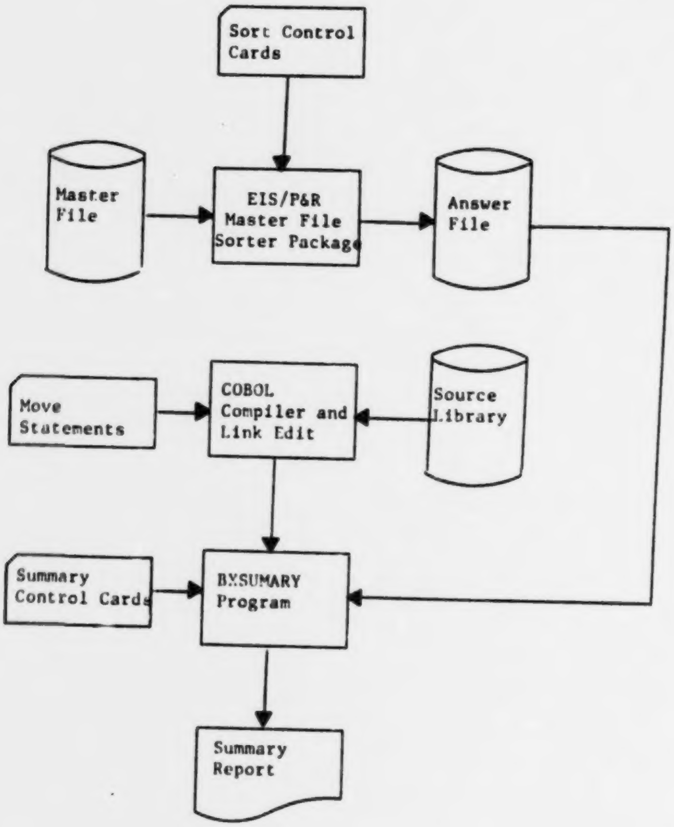

Master File
Sort Control Cards
EIS/P&R Master File Sorter Package
Answer File
Summary Control Cards
BXSUMARY Program
Summary Report

Deck

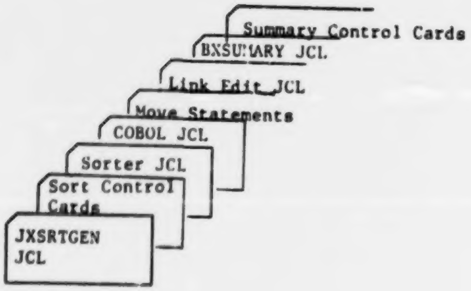

Summary Control Cards
BXSUMARY JCL
Master File Sorter JCL
Sort Control Cards
BXSRTGEN JCL

PERMANENT SUMMARY REPORT EXECUTION
Figure 4.2-2

Data Flow


Sort Control Cards
Master File
EIS/P&R Master File Sorter Package
Answer File
Move Statements
COBOL Compiler and Link Edit
Source Library
Summary Control Cards
BXSUMARY Program
Summary Report

Deck


Summary Control Cards
BXSUMARY JCL
Link Edit JCL
Move Statements
COBOL JCL
Sorter JCL
Sort Control Cards
JXSRTGEN JCL

TEMPORARY SUMMARY REPORT GENERATION AND EXECUTION
Figure 4.2-3

```
//STEP1   EXEC PNRSORTR
//COMPILE.INPUT  DD *
$$SORT
STATE                                   A
COUNTY                                  A
AQCR                                    A
PLANT-ID                                A
POLLUTANT-ID                            A
$$END
//STEP2   EXEC PNRBREPT,
//             MSTRFIL=STSORTAA
//COMPILE.INPUT  DD *
           MOVE MSTR-POLLUTION-ID (EM-SET-INDEX) TO BREAK-ONE.
           MOVE MSTR-PLANT-ID TO BREAK-TWO.
           MOVE MSTR-AQCR TO BREAK-THREE.
           MOVE MSTR-COUNTY TO BREAK-FOUR.
           MOVE MSTR-STATE TO BREAK-FIVE.
//SUMMARY.INPUT  DD *
OP1  CDHS EIS/P&R SUBSYSTEM          DETAILED SUMMARY REPORT          01/03/75
OP2  DOCUMENTATION EXAMPLE           POTENTIAL EIS/P&R USERS
OP3  STATE          COUNTY           AQCR           PLANT
OP4  POLL-ID.
```

TEMPORARY SUMMARY REPORT GENERATION AND EXECUTION
SAMPLE JOB STREAM
Figure 4.2-3.1

```
$$SORT
STATE                          A
COUNTY                         A
AQCR                           A
PLANT-ID                       A
POLLUTANT-ID                   A
$$END
```

Summary Report Example
AD HOC Test 1 of EIS/P&R Test Package
(SORT Specifications)
Figure 4.2-4

```
$$SELECT
POLLUTANT-ID                        = POLLUTANT-ID
$$END
```

Summary Report Example
AD HOC Test ' of EIS/P&R Test Package
(Retrieval Request)
Figure 4.2-4 (continued)

```
MOVE MSTR-POLLUTION-ID (EM SET-INDEX) TO BREAK-ONE.
MOVE MSTR-PLANT-ID TO BREAK-TWO.
MOVE MSTR-AQCR TO BREAK-THREE.
MOVE MSTR-COUNTY TO BREAK-FOUR.
MOVE MSTR-STATE TO BREAK-FIVE.
```

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Summary Report Example
<u>AD HOC Test 1 of EIS/P&R Test Package</u>
(Summary Specifications)
Figure 4.2-4 (continued)

```
CP1  EIS/P&R INSTALLATION TEAM          AD HOC DEMONSTRATION          03/09/73
CP2
CP3  STATE           COUNTY            AQCR            PLANT
CP4  POLL-ID.
```

Summary Report Example
AD HOC Test 1 of EIS/P&R Test Package
(Report Headers)
Figure 4.2-4 (continued)

```
                              AIR POLLUTANT EMISSIONS SUMMARY                                                 03/09/7
   EIS/P&R INSTALLATION TEAM
    AD HOC DEMONSTRATION                                                FROM  AIR POLLUTION CONTROL AGENCY
                                                                        FOR   INFORMATION

STATE     COUNTY    AQCR     PLANT     POLL-ID.         NUMBER   ESTIMATES     ACTUAL      ALLOWABLE    CONTROL
                                                        SOURCES  EMISSIONS     EMISSIONS   EMISSIONS    EQUIPMENT COST
                                       11101        *        1       1,492           0             7            $.00
                                       42101        *        1           0           0             0            $.00
                                       42401        *        1     149,190           0             0            $.00
                                       42602        *        1           0      10,101             0            $.00
                                       43101        *        1           0           0             0            $.00
                             0025                  **        5     150,682      10,101             7            $.00
                                       11101        *        3       3,971           0             0            $.00
                                       42101        *        3           0           0           300            $.00
                                       42401        *        3      22,694           0        20,000            $.00
                                       42602        *        3           9           0        50,000            $.00
                                       43101        *        3           1           0       400,000            $.00
                             0060                  **       15      26,675           0       470,300            $.00
                                       11101        *       14     983,349           0             0            $.00
                                       42101        *       14     360,156           0             0            $.00
                                       42401        *       14   1,880,369           0             0            $.00
                                       42602        *       14     147,105           0             0            $.00
                                       43101        *       14     149,521           0             0            $.00
                             9999                  **       70   3,520,500           0             0            $.00
                    067                           ***       90   3,697,857      10,101       470,307            $.00
                                       11101        *        2       1,890           0             0            $.00
                                                                                                           PAGE    1
```

Summary Report Example
AD HOC Test 1 of EIS/P&R Test Package
Figure 4.2-4 (continued)

```
                                         AIR POLLUTANT EMISSIONS SUMMARY                                   03/09/7
     EIS/P&R INSTALLATION TEAM                                                         FROM  AIR POLLUTION CONTROL AGENCY
       AD HOC DEMONSTRATION                                                            FOR   INFORMATION

STATE    COUNTY   AQCR     PLANT    POLL-ID.           NUMBER   ESTIMATES       ACTUAL      ALLOWABLE    CONTROL
                                                       SOURCES  EMISSIONS       EMISSIONS   EMISSIONS    EQUIPMENT COST
                                    42101          *       2            0            0            0              $.00
                                    42401          *       2       18,904            0            0              $.00
                                    42602          *       2            0            0            0              $.00
                                    43101          *       2            0            0            0              $.00
                           0050                   **      10       20,794            0            0              $.00
                                    11101          *      13    1,428,988            0            0              $.00
                                    42101          *      13      172,874            0            0              $.00
                                    42401          *      13    1,076,954            0            0              $.00
                                    42602          *      13    2,753,636            0            0              $.00
                                    43101          *      13      137,240            0            0              $.00
                           9999                   **      65    5,569,692            0            0              $.00
                  089                            ***      75    5,590,486            0            0              $.00
         1230                                   ****     165    9,288,343       10,101      470,307              $.00
                                    11101          *       1          262            0            0              $.00
                                    42101          *       1       43,618            0            0              $.00
                                    42401          *       1       17,447            0            0              $.00
                                    42602          *       1       26,171            0            0              $.00
                                    43101          *       1       34,894            0            0              $.00
                           0025                   **       5      122,392            0            0              $.00
                                    11101          *       2          732            0            0              $.00

                                                                                                        PAGE    2
```

Summary Report Example
AD HOC Test 1 of EIS/P&R Test Package
Figure 4.2-4 (continued)

```
                              AIR POLLUTANT EMISSIONS SUMMARY                             03/09/7

   EIS/P&R INSTALLATION TEAM                                              FROM  AIR POLLUTION CONTROL AGENCY
     AD HOC DEMONSTRATION                                                 FOR   INFORMATION

STATE    COUNTY   AQCR     PLANT     POLL-ID.         NUMBER  ESTIMATES    ACTUAL     ALLOWABLE   CONTROL
                                                      SOURCES EMISSIONS    EMISSIONS  EMISSIONS   EQUIPMENT COST

                                     42101        *       2       3,660          0           0             $.00
                                     42401        *       2          34          0           0             $.00
                                     42602        *       2          52          0           0             $.00
                                     43101        *       2          69          0           0             $.00
                            0075                 **      10       4,547          0           0             $.00
                                     11101        *       1         928          0           0             $.00
                                     42101        *       1           0          0           0             $.00
                                     42401        *       1       9,277          0           0             $.00
                                     42602        *       1           0          0           0             $.00
                                     43101        *       1           0          0           0             $.00
                            0125                 **       5      10,205          0           0             $.00
                   089                          ***      20     137,144          0           0             $.00
         2230                                  ****      20     137,144          0           0             $.00
                                     11101        *       1           0          0           0             $.00
                                     42101        *       1           0          0           0             $.00
                                     42401        *       1           0          0           0             $.00
                                     42602        *       1           0          0           0             $.00
                                     43101        *       1           0          0           0             $.00
                            0275                 **       5           0          0           0             $.00
                                     11101        *       1           8          0           0             $.00

                                                                                               PAGE    3
```

Summary Report Example
AD HOC Test 1 of EIS/P&R Test Package
Figure 4.2-4 (continued)

```
                                AIR POLLUTANT EMISSIONS SUMMARY                                    03/09/7

     EIS/P&R INSTALLATION TEAM                                              FROM  AIR POLLUTION CONTROL AGENCY
       AD HOC DEMONSTRATION                                                 FOR   INFORMATION

STATE     COUNTY    AQCR      PLANT     POLL-ID.          NUMBER   ESTIMATES      ACTUAL     ALLOWABLE   CONTROL
                                                          SOURCES  EMISSIONS      EMISSIONS  EMISSIONS   EQUIPMENT COST
                                        42401       *       1              0          0           0            $.00
                                        42602       *       1              0          0           0            $.00
                                        43101       *       1              0          0           0            $.00
                              1401                  **      4              8          0           0            $.00
                                        11101       *       3          1,428          0         250            $.00
                                        42101       *       3          5,889          0           0            $.00
                                        42401       *       3          2,356          0           0            $.00
                                        42602       *       3         67,026          0      37,500            $.00
                                        43101       *       3          4,711          0           0            $.00
                              1600                  **     15         81,410          0      37,750            $.00
                                        11101       *       8         54,054          0           0            $.00
                                        42101       *       6        143,909          0           0            $.00
                                        42401       *       8         90,538          0           0            $.00
                                        42602       *       8         15,890          0           0            $.00
                                        43101       *       8         51,522          0           0            $.00
                              9999                  **     40        355,913          0           0            $.00
                    092                             ***    64        437,331          0      37,750            $.00
                                        11101       *       7         68,890          0           0            $.00
                                        42101       *       7          3,396          0           0            $.00
                                        42401       *       7        164,908          0           0            $.00
                                                                                                        PAGE    4
```

Summary Report Example
AD HOC Test 1 of EIS/P&R Test Package
Figure 4.2-4 (continued)

```
                                   AIR POLLUTANT EMISSIONS SUMMARY                                      03/39/7
      EIS/P&R INSTALLATION TEAM                                                 FROM  AIR POLLUTION CONTROL AGENCY
        AD HOC DEMONSTRATION                                                    FOR   INFORMATION

STATE     COUNTY    AQCR     PLANT     POLL-ID.          NUMBER   ESTIMATES       ACTUAL      ALLOWABLE    CONTROL
                                                         SOURCES  EMISSIONS       EMISSIONS   EMISSIONS    EQUIPMENT COST

                                       42602       *         7        7,797            0            0              $.00

                                       43101       *         7            0            0            0              $.00

                             9999                 **        35      244,991            0            0              $.00

                    105                          ***        35      244,991            0            0              $.00

          3120                                  ****        99      692,322            0       37,750              $.00

19                                             *****       284   10,107,809       10,101      508,057              $.00


                                           TOTAL                                                                   $.00
```

Summary Report Example
AD HOC Test 1 of EIS/P&R Test Package
Figure 4.2-4 (continued)

PAGE   5

4.2.1 ORGANIZATION

The report summary capability consists of the following routines:

- ROOT-SEGMENT - This is the highest level routine. It opens and closes data sets, initiates and terminates the COBOL Report Writer, and controls processing of the summary report.

- CTL-READ-INIT - This is a second level routine which controls the reading and initialization of the summary header control cards.

- CTL-CARD-LOOP - This is a third level routine which reads control cards and controls processing of the control cards.

- CTL-CARD-OP1 - This is a fourth level routine which processes the "OP1" control card.

- CTL-CARD-OP2 - This is a fourth level routine which processes the "OP2" control card.

- CTL-CARD-OP3 - This is a fourth level routine which processes the "OP3" control card.

- CTL-CARD-OP4 - This is a fourth level routine which processes the "OP4" control card.

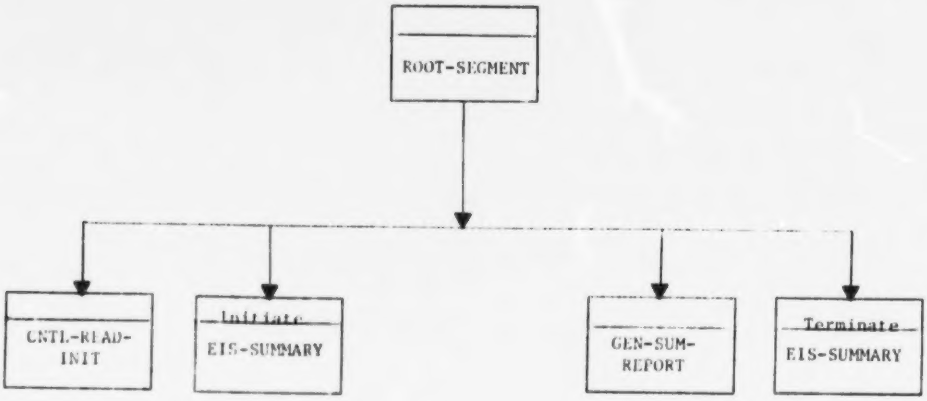
- GEN-SUM-REPORT - This is a second level routine which controls reading of the EIS/P&R file data and preparation of that data. It also "drives" the portion of the Report Writer which generates the summary.

- READ-ZERO-ONE-REC - This is a third level routine which reads an EIS/P&R file record and moves it to working storage.

- FIELD-INIT - This is a third level routine which ensures that all accumulated values are numeric.

- SET-BREAK-VALUES - This is a third level routine which sets the user-specified break control values.

Figure 4.2.1 illustrates the organization of BXSUMARY.


ROOT-SEGMENT
CNTL-READ-INIT
Initiate
EIS-SUMMARY
GEN-SUM-REPORT
Terminate
EIS-SUMMARY

BXSUMARY Organization
Figure 4.2.1

4.2.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the Summary Report program:

- EISFILE - This is an input data set and contains the sorted Answer File.
- SUMCARDS - This is an input data set and contains the summary header control cards.
- CARDLOG - This is an output data set for logging the summary header control cards.
- SUMFILE - This is an output data set for the summary report.

The summary program uses the following data/communication areas:

- OLD-CONTROL - This array resides in the file section and defines the EIS/P&R record key.
- OLD-MASTO - This array resides in the file section and defines the EIS/P&R zero segment.
- OLD-MAST1 - This array resides in the file section and defines the EIS/P&R one segment.
- OLD-MAST2 - This array resides in the file section and defines the EIS/P&R two segment.
- BREAK-ONE - Lowest level control value in working storage.
  BREAK-TWO - Second lowest level control value in working storage.
  BREAK-THREE - Third lowest level control value in working storage.

BREAK-FOUR - Fourth lowest level control value in working storage.
BREAK-FIVE - Highest level control value in working storage.

- CTL-CRD-ONE - This array resides in working storage and describes control card one.

- CTL-CRD-TWO - This array resides in working storage and describes control card two.

- CTL-CRD-THREE - This array resides in working storage and describes control card three.

- CTL-CRD-FOUR - This array resides in working storage and describes control card four.

- EMT-SET-INDEX - This data name must be used as a subscript when referring to any data item in the repeating portion of the record. For example, if Primary Control Equipment is to be the second control break, the statement would be written - MOVE MSTR-PRIMARY (EM-SET-INDEX) TO BREAK-TWO.

- MSTR-FIXED-SEGMENT - This array resides in working storage and describes the EIS/P&R zero record.

- MSTR-POINT-SOURCE - This array resides in working storage and describes the EIS/P&R one record.

- SUM-BUCKETS - This array resides in working storage. It defines temporary storage for values being accumulated.

4.2.3 ROUTINES

COBOL Report Writer

The COBOL Report Writer section has seven control fields. These are in order of level (high to low):

1 - Final
2 - Control-Separate
3 - Break-Five
4 - Break-Four
5 - Break-Three
6 - Break-Two
7 - Break-One

It has a page heading and a page footing. There is a detail line, without output, to trigger the summary accumulation. There is a heading control on CONTROL-SEPARATE which can be used to create a separation line (should only be used when all five breaks are specified). There are control footings for each break.

4.2.4 DIAGNOSTIC MESSAGES

There are no diagnostics generated by this program.

4.3 NEDS POINT SOURCE OUTPUT

The NEDS Point Source Output program converts the records on an EIS/P&R file to NEDS format point source records. Each EIS/P&R record is converted as follows: the type 0 record produces a P1 record; the type 1 record produces P2, P3, P4 and P5 records; each type 2 record produces a P6 record; and each type 3 record is ignored. If a single plant (type 0 record) has more than one point source (type 1 record), the P1 record is repeated for each new type 1 record. If area source data is in the same file as point source data, the point source data should be selected onto a separate file by use of the EIS/P&R retrieval capability (USER-PLANT-ID N = 'AREA SOURCE').

The type of P cards to be produced are determined by an input control card specifying add, change or delete. Therefore, a control card with 'A' in card column 1 will cause AP cards to be produced. A 'C' in card column 1 will cause CP cards to be produced, and a 'D' in card column 1 will cause DP cards to be produced. Default (no control card) will be 'C'.

EPA requires a NEDS Report semiannually. It is not currently possible to automatically prepare a complete NEDS Report using EIS/P&R. By using certain features of the system however, manual intervention can be kept to a minimum. The following procedure is recommended to assist state and local agencies in preparation of reports to EPA.

1. As new facilities are added to the Master File, save the EIS/P&R transaction cards. When time comes to prepare the NEDS submittal for new sources, these ADD cards may be used to create a "temporary" file for conversion to NEDS format. This eliminates maintaining a list of new sources and retrieving them from the Master File. To avoid retrieving these facilities in a later step, the user must use the data of the last NEDS report or an

eariler date for the segment dates. NEDS only requires the year of record and is not interested in the complete date.

2. Maintain a manual list by plant and point ID of changes to "Points with Common Stack" field and of facilities having a change of SCC number. For these facilities it is necessary to manually create a NEDS DELETE card to go with the ADD cards generated by the EIS/P&R to NEDS conversion program.

3. Retrieve all facilities that have changed since last NEDS submittal.

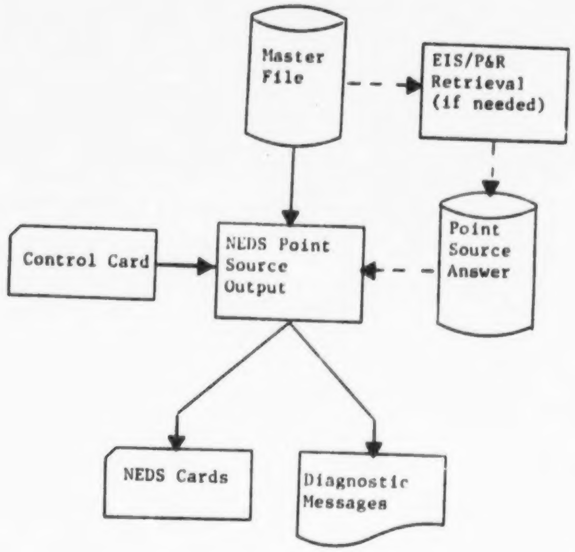
4. Retrieve from the Answer File created in Step 3 the facilities with changes to PWCS or changes to SCC codes. These records then should be processed by the NEDS Point Source Output program using an ADD control card. The required NEDS ADD cards are selected from the output and matched with delete cards manually created in Step 2 for the NEDS submittal.

5. The remaining records on the Answer File created in Step 3 are then retrieved and converted to CHANGE cards using a "C" control card. These cards form the remainder of the NEDS submittal.

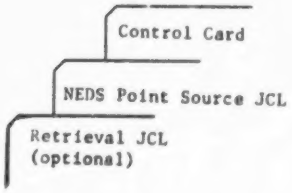
The data flow and run deck setup are illustrated in Figure 4.3-1.

Figure 4.3-2 illustrates an example of the output from the NEDS Point Source Output program along with the retrieval request generating the Answer File prior to the output. The example is taken from AD HOC Run 3 of the EIS/P&R Test package.

Data Flow


Master File
EIS/P&R Retrieval (if needed)
Point Source Answer
Control Card
NEDS Point Source Output
NEDS Cards
Diagnostic Messages

Deck


Control Card
NEDS Point Source JCL
Retrieval JCL (optional)

NEDS POINT SOURCE OUTPUT - DATA FLOW AND DECK
Figure 4.3-1

```
$$SELECT
USER-PLANT-ID                 N = 'AREA SOURCE'               AND
DATE-OF-0-RECORD                > '73001'                     OR
DATE-OF-1-RECORD                > '73001'
$$END
```

NEDS Point Source Output Example
AD HOC Run 3 of EIS/P&R Test Package
(Retrieval Request)
Figure 4.3-2

```
                            EIS TO NEDS POINT SOURCE CONVERSION PROGRAM                           PAGE  1
CONTROL CARD MISSING OR INVALID - CHANGE OPTION ASSUMED
1912800670025044 1573WATT POWER CO.                                    D.E. DUCK  PF   CP1
19128006700250173000000000000000341180305064567500000                                  CP2
1912800670025017302010010000060000000000006700070600009800000000000000                 CP3
19128006700250173242228262475000067880545679000000000000000000000033000000             CP4
19128006700250173000007000000000000000000000000000000 000000000                        CP5
191280067002501732020020000497300       30009100020                     B2             CP6
1912800670060012601572SHOCKING POWER CO.                               E.E.ELECTRICF   CP1
19128006700600173000000000000000001290760320018300000000                               CP2
1912800670060017300572009000060000060000060000060000650000000000000000                 CP3
19128006700600173002255232474500029571002265400000000000000000000000033000000          CP4
191280067006001730000000000000000000000000000000000000 000000000                       CP5
191280067006001722020020100069320       31510500023                     E2             CF6
191280067006001722220260100001354       63400000999                     B2             CF6
1912800670060126015725HOCKING POWER CO.                                E.E.ELECTRICF   CP1
1912800670060027300000000000000000010605000650009600270000                             CF2
191280067006002730012906000000000006000006000006000000000000000000000                  CP3
1912800670060027304005541247040000000000000000000009000000100000000000000000           CP4
191280067006002730000000000000000000000000000000000000 000000000                       CP5
191280067006002725010050100000013       00700000140                     B2             CF6
191280067006002725010060100000044       00000000999                     P2             CP6
191280089005006401573METROPOLIS, U.S.A.                                LOIS LANE   F   CP1
19128008900500172000000000000000000018013003130199098000                               CP2
19128008900500172005380078000060000006000006000008000000000000000000                   CP3
19128008900500172124226102474200000300030031000000000000000000000033000000             CP4
191280089005001720000000000000000000000000000000000000 000000000                       CF5
191280089005001722010020100081586       02910200021                     B2             CP6
191280089005001722010060100001030       634F0000995                     P2             CF6
191280089005006401573METROPOLIS, U.S.A.                                LOIS LANE   F   CP1
19128008900500272000000000000000000019016003440193000000                               CF2
191280089005002720053100000000000000006000060000060000300000000000000                  CP3
1912800890050027212313123247070015870015873000000000000000000000033000000              CF4
191280089005002720000000000000000000000000000000000000 000000000                       CF5
191280089005002726010020100052007       25010700021                     E2             CF6
191280089005002726010060100001240       63400000995                     B2             CP6
1922800890025000015 72SHAKY CONSTRUCTION CO.                           J.P. JELLO      CP1
19228008900250173295101000000000000240400275004500000000                               CP2
1922800890025017300000000700006000000600000600000600009700000000000000                 CP3
192280089002501722073402011636000026200174470026171003489400436183333000               CP4
192280089002501730000000000000000000000000000000000000 000000000                       CF5
192280089002501722010000001744720000000000000000000ASPHALT - DRIER      P2             CP6
19228008900752500 1572NO GOOD FOUNDRY                                  HONEST JOHN     CP1
192280089007501730321010000000000346060126000763410000                                 CF2
1922800890075017300000006000006000006000006000006000000000000000000000                 CP3
19228008900750173252525252508550000071500000000000000000000000000357430003000          CF4
192280089007501730000000000000000000000000000000000000 000000000                       CP5
1922800890075017230100000014254429400000000000000000CUPOLA                  P2         CF6

END OF JOB
```

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NEDS Point Source Output Example
AD HOC Run 3 of EIS/P&R Test Package
Figure 4.3-2 (continued)

4.3.1 ORGANIZATION

The following are the main modules of the NEDS Point Source output program.

- MAIN-LOOP

  This routine is performed by ROOT-SEGMENT until an end of file is detected on the EIS/P&R File. It determines the record type and invokes the appropriate conversion routine. If the record type is invalid, a diagnostic message is printed and processing continues with the next EIS/P&R record.

- ZERO-RECORD-CONVERSION

  This routine initializes all NEDS records to blanks and saves the key portion of the type 0 EIS/P&R record. It then converts the EIS/P&R record to a NEDS P1 and outputs it. The type of P1 record is determined by the control card processed by PGM-INIT.

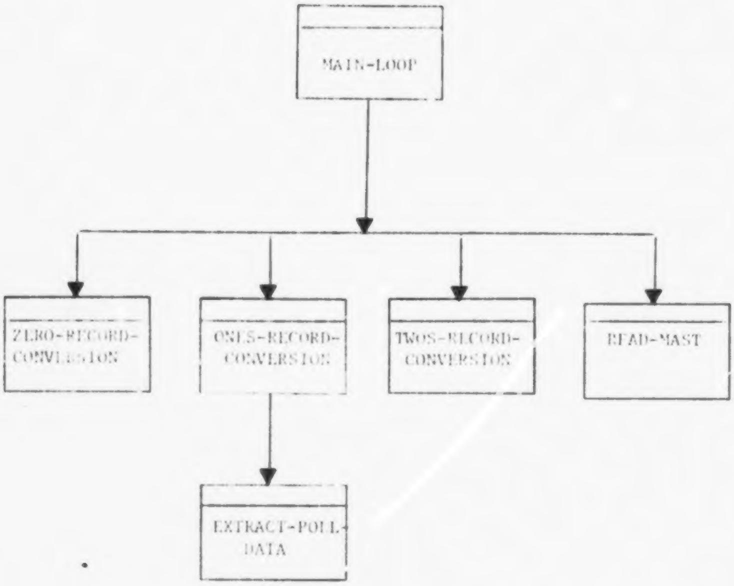
- ONES-RECORD-CONVERSION

  If the NEDS P1 record has yet to be written (i.e., this is not the first type 1 EIS/P&R record with this key), this routine will write the previously created NEDS P1 record and then proceed to convert the EIS/P&R type 1 record. A routine named EXTRACT-POLLUTANT-DATA is invoked to extract variable length pollutant data from the type 1 record. After the NEDS P2, P3, P4, and P5 records are built, they are output. The type of P2, P3, P4, and P5 records is determined by the input control card.

- TWOS-RECORD-CONVERSION

  This routine converts the EIS/P&R type 2 record to a NEDS P6 record and outputs it. The type of P6 record is determined by the input control card.

Figure 4.3.1 illustrates the organization of NXNEDSCV.


MAIN-LOOP
ZERO-RECORD-CONVERSION
ONES-RECORD-CONVERSION
TWOS-RECORD-CONVERSION
READ-MAST
EXTRACT-POLL-DATA

NXNEDSCV Organization
Figure 4.3.1

4.3.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE fields are the major control flags internal to NEDS Point Source Output program.

- NEDS-01-WRITTEN-SW - Used by the ONES-RECORD-CONVERSION routine to determine if the NEDS P1 record has been written (NEDS-01-WRITTEN-SW = 1) or if it has to be written (NEDS-01-WRITTEN-SW = 0).

- END-OF-FILE-SW - Used by the ROOT-SEGMENT to determine when all records from the EIS/P&R File have been written (END-OF-FILE-SW = 1).

4.3.3 ROUTINES

There are no major subroutines in this program.

4.3.4 DIAGNOSTIC MESSAGES

The following are the diagnostic messages that may be generated by the NEDS Point Source Output program.

Message: Unknown record type on master file.
Meaning: System is unable to identify record type.
Action: No action required.

Message: Control card missing or invalid - change option assumed.
Meaning: The NEDS records are generated as either ADDS, CHANGES or DELETED. If the control card is missing, or does not have an "A", "C" or "D" in the first column, a CHANGE is assumed.
Action: Correct error and resubmit transaction.

4.4 NEDS AREA SOURCE OUTPUT

This program produces NEDS area source output from EIS/P&R area source data. The program expects input to be area source data. Therefore, if area source data is in the same file as point source data, it must be selected onto a separate file by use of the EIS/P&R retrieval capability (USER-PLANT-ID = 'AREA SOURCE').

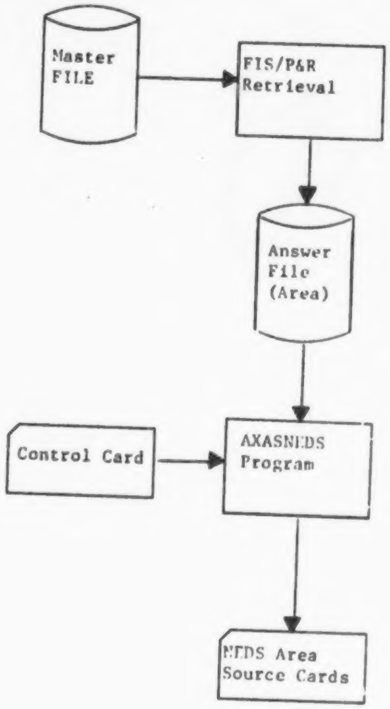
There is one control card which allows the user to specify whether the NEDS "action" code will be "A" (add), "D" (delete) or "C" (change). The action code is in column 1. The default (no control card) will be "C".

NEDS area source records are generated by creating a set of records from a logical EIS/P&R record. This is done by accumulating the estimated emissions and moving the values from the EIS/P&R record to the NEDS record. When all values have been set in the NEDS records, the entire set is output.

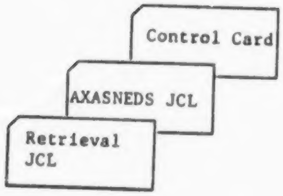
The data flow and deck setup are illustrated in Figure 4.4-1.

Figure 4.4-2 illustrates an example of the output from the NEDS Area Source Output program along with the retrieval request generating the Answer File prior to the output. The example is taken from Retrieval Run 1 of the EIS/P&R Test package.

Data Flow


Master FILE
FIS/P&R Retrieval
Answer File (Area)
Control Card
AXASNEDS Program
NEDS Area Source Cards

Deck


Control Card
AXASNEDS JCL
Retrieval JCL

NEDS AREA SOURCE OUTPUT - DATA FLOW AND DECK
Figure 4.4-1

```
$$SELECT                                                                      00000100
USER-PLANT-ID                    = 'AREA SOURCE'                              00000200
$$END                                                                         00000300
```

NEDS Area Source Output Example
Retrieval Run 1 of EIS/P&R Test Package
(Retrieval Request)
Figure 4.4-2

```
NEDS AREA SOURCE LOG

CONTROL CARD MISSING OR INVALID - CHANGE OPTION ASSUMED

19128006773098331880414710149503602444411110440440123020010097508900235500050CA1
191280067235003475042100003908750050987501234009850215000098056900025235O    CA2
191280067234500032150432500980000097501210002345002155000975295000500085012502CA3
1912800672350123505432500757500002500050001235032100000975000050321500009875O CA4
19128006700000500010002250003500001575050002195022500013001230005450190       CA5
191280067PRODUCED BY THE CDHS EMISSION INVENTORY SUBSYSTEM.                   CA6

19128006973142901077075360137201729444411440440449850      79500      67800      CA1
191280069     67675          8650  099750009050565045600032100             3450  CA2
191280069       500502350        009950       543210065400      56750     23452CA3
191280069    005000543000    5675              70750              234500         CA4
191280069                 09650              010900250        1500               CA5
191280069PRODUCED BY THE CDHS EMISSION INVENTORY SUBSYSTEM.                      CA6

193120092730054100905015900515014394444444  044044                     76500     CA1
1931200921230003215056750              012350023450     54325                    CA2
1931200922345000543500                                        32100         12342CA3
193120092         45670                         34500                            CA4
193120092              05430                                                     CA5
193120092PRODUCED BY THE CDHS EMISSION INVENTORY SUBSYSTEM.                      CA6

1931201057300689016490078000000034    4433                12350      63050      CA1
193120105          257500125003450                765045675     56750           CA2
193120105                        123500                        12300       21002CA3
193120105                                                     005400234500      CA4
193120105                                                     2100              CA5
193120105PRODUCED BY THE CDHS EMISSION INVENTORY SUBSYSTEM.                     CA6
```

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NEDS Area Source Output Example
Retrieval Run 1 of EIS/P&R Test Package
Figure 4.4-2 (continued)

4.4.1 ORGANIZATION

The program consists of the following routines:

- ROOT-SEGMENT - This is the highest level routine. It opens and closes files and controls processing until all EIS/P&R data has been processed.

- GEN-NEDS-AS-RECS - This is a second level routine. It reads the EIS/P&R records and controls processing until a logical record has been processed. It then causes the NEDS records which have been generated as a result of this processing to be output.

- EIS-FILE-EOF - This is a third level routine. It is executed when an end of file on the EIS/P&R file has been encountered. It determines whether NEDS records need to be output and causes them to be output where required.

- OUTPUT-NEDS-AREA-SOURCE - This is a third level routine. It converts the accumulated emissions to hundreds of tons. These emissions are moved to the NEDS A1 card. All NEDS cards are then logged on the printer and written on the output data set.

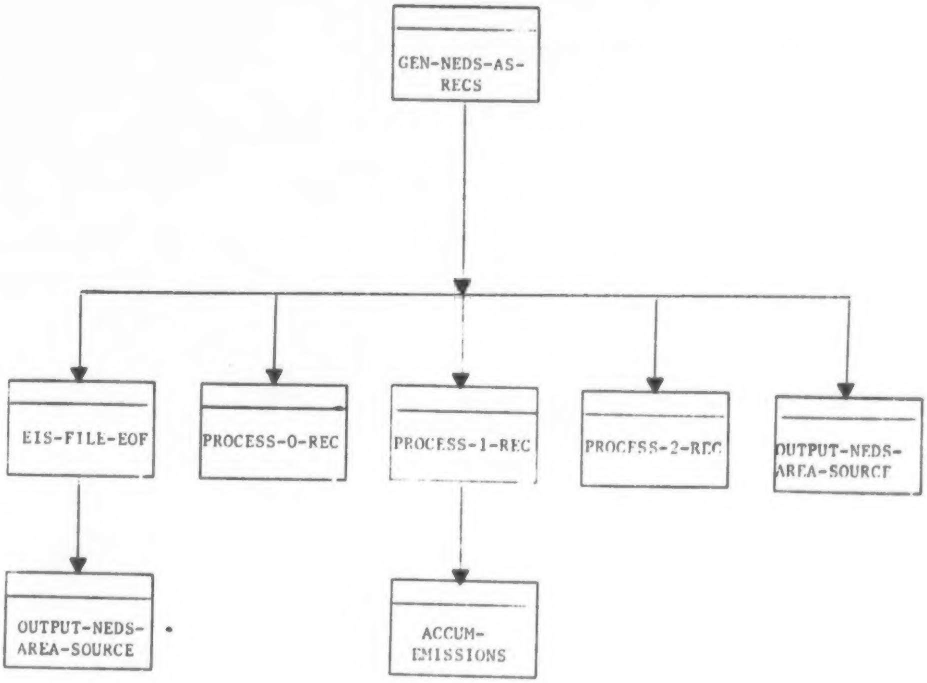
- PROCESS-0-REC - This is a third level routine. It initializes the NEDS record areas and the emissions accumulators.

- PROCESS-1-REC - This is a third level routine. This routine causes emissions to be accumulated for all pollutants.

- ACCUM-EMISSIONS - This is a fourth level routine. It causes emissions to be accumulated in the appropriate pollutant accumulator.

- PROCESS-2-REC - This is a third level routine. It controls execution of the routines which set the fuel/pollution source values.

Figure 4.4.1 illustrates the organization of AXASNEDS.


GEN-NEDS-AS-RECS
EIS-FILE-EOF
PROCESS-0-REC
PROCESS-1-REC
PROCESS-2-REC
OUTPUT-NEDS-AREA-SOURCE
OUTPUT-NEDS-AREA-SOURCE
ACCUM-EMISSIONS

AXASNEDS Organization
Figure 4.4.1

4.4.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the NEDS Area Source Output program:

- EISFILE - This is the input data file. It may be a Master File or an Answer File, provided that it contains only area source data records.

- NEDASFIL - This is the output file for the NEDS format area source records.

- NEDASLOG - This is the printer log for the NEDS format area source records.

- MSTR-FIXED-SEGMENT - This data array resides in the file section and describes the format of the EIS/P&R master fixed (record 0) segment.

- MSTR-POINT-SEGMENT - This data array resides in the file section and describes the format of the EIS/P&R master point (record 1) segment.

- MSTR-MACHINE-PROCESS - This data array resides in the file section and describes the format of the EIS/P&R master machine (record 2) segment.

- CARD-STORAGE-AREA - This data array resides in the working storage section and describes the format of NEDS area source records A1-A5.

- AA6-CARD-OUTPUT - This data array resides in the working storage section and describes the format of NEDS area source record A6.

- WORK-SCC - This data array resides in the working storage section and describes the format of the SCC.

- POLL-ID-TABLE - This data array resides in the working storage section and defines the area source pollutant codes.

- AS-FUEL-CODES - This data array resides in the working storage section and defines the fuel/pollution source codes.

- SUL-ASH-CODES - This data array resides in the working storage section and defines the sulfur/ash codes.

4.4.3 ROUTINES

The following are internal routines of the NEDS Area Source Output program.

- RES-FUEL - This subroutine sets the Residential Fuel values.
- COMM-AND-INST-FUEL - This subroutine sets the Commercial and Institutional Fuel values.
- INDUST-FUEL - This subroutine sets the Industrial Fuel values.
- ON-SITE-INCIN - This subroutine sets the On-Site Incineration Pollutant values.
- OPEN-BURN - This subroutine sets the Open Burning Pollutant values.
- GAS-FUEL - This subroutine sets the Gasoline Fuel values.
- DIES-FUEL - This subroutine sets the Diesel Fuel values.
- AIR - This subroutine sets the Aircraft Pollutant values.
- VES - This subroutine sets the Vessels Pollutant values.
- EVAPOR - This subroutine sets the Evaporation Pollutant values.
- MEAS-VEH-MILE - This subroutine sets the Measured Vehicle Mile Pollutant values.
- MISC-DUST - This subroutine sets the Miscellaneous Dust Pollutant values.

- MISC-BURN - This subroutine sets the Miscellaneous Burning Pollutant values.

4.4.4 DIAGNOSTIC MESSAGES

The following are the diagnostic messages that may be generated by the NEDS Area Source Output program.

Message: Control card missing or invalid - change option assumed.

Meaning: If a control card of A,C, or D is not input to the NEDS Area Source Output program, the program defaults to generate change cards.

Action: If C was not the option wanted, correct the control card and resubmit.

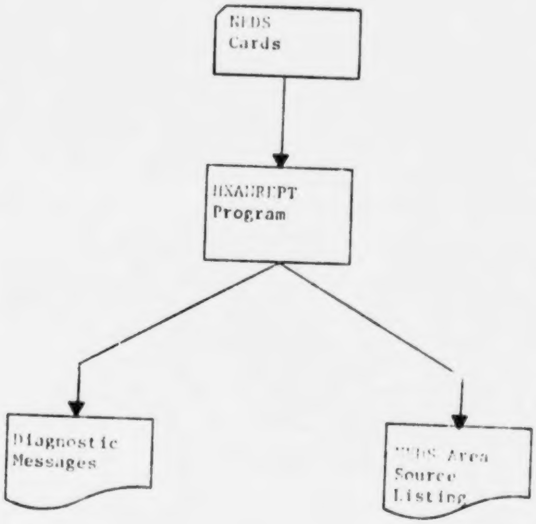
4.5 NEDS AREA SOURCE REPORT

The NEDS Area Source Report program produces a formatted listing from NEDS area source records. One complete set of NEDS area source records (A1 through A6) will be listed per page. If errors exist in the NEDS records, the results will be unpredictable.

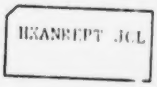
The data flow and run deck setup are illustrated in Figure 4.5-1.

Figure 4.5-2 illustrates a page of the NEDS Area Source Report along with the retrieval request generating the Answer File prior to output. The example is taken from Retrieval Run 1 of the EIS/P&R Test package.

Data Flow


NEDS Cards
HXANREPT Program
Diagnostic Messages
NEDS Area Source Listing

Deck


HXANREPT JCL

NEDS AREA SOURCE REPORT - DATA FLOW AND DECK
Figure 4.5-1

```
$$SELECT                                                00000100
USER-PLANT-ID               = 'AREA SOURCE'             00000200
$$END                                                   00000300
```

NEDS Area Source Report Example
Retrieval Run 1 of EIS/P&R Test Package
(Retrieval Request)
Figure 4.5-2

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```
        STATE  COUNTY  AQCR                                                                                      PAGE    1

          19    1280    067

 YEAR              EMISSION ESTIMATES                SULFUR CONTENT       ASH CONTENT      R E S I D E N T I A L   F U E L
  OF                                                      DIST RESID                                   DIST   RESID NAT 'L
RECORD   PART    SO2    NOX    HC     CO    ANTH BITUM OIL  OIL    ANTH  BITUM    ANTH  BITUM   OIL    OIL    GAS    WOOD

  73     39633  18804   1471  01495  03602   4.4  4.4  1.1  1.1    04.4  04.4     0123  02001  00975  08900  23550  0050


      COMMERCIAL AND INSTITUTIONAL FUEL                                  I N D U S T R I A L     F U E L
                        DIST    RESID   NAT'L                                                DIST   RESID   NAT 'L           PROCESS
 ANTH     BITUM         OIL     OIL     GAS    WOOD     ANTH      BITUM      COKE    OIL     OIL     GAS     WOOD     GAS

 23500    34750        42100   00390   8750    05      098750    123400     9650    21500   00980   56900    025      2350


O N   S I T E   I N C I N E R A T I O N                  O P E N    B U R N I N G
                              COMMERCIAL &                                         COMMERCIAL &
RESIDENTIAL   INDUSTRIAL    INSTITUTIONAL                RESIDENTIAL  INDUSTRIAL   INSTITUTIONAL

  234500         32150          4325                      009800       000975         012100


    GASOLINE FUEL                       DIESEL FUEL
 LIGHT     HEAVY     OFF          HEAVY     OFF       RAIL                      COUNTY              DENSITY
VEHICLE   VEHICLE   HIWAY        VEHICLE   HIWAY   LOCOMOTIVE                 POPULATION             CODE

0234500    21550    00975         29500     050       00850                      1250                  2


      A I R C R A F T                          V E S S E L S               E V A P O R A T I O N       MEASURED    VEHICLE    MILES
 MILITARY    CIVIL  COMMERCIAL             DIESEL RESID                 SOLVENT       GASOLINE       LIMITED
 LTO CYC    LTO CYC   LTO CYC         ANTH  OIL    OIL   GASOLINE       PURCHASED     MARKETED       ACCESS   RURAL   SUBURBAN  URBAN

   2250      12350     54325          0075  7500  00250   0050           012350        32100         000975   000050   321500   0098750


   DIRT      DIRT                       ROCK         FOREST FIRES      SLASH BURNING      FROST CONTROL                    COAL REFUSE
  ROADS     STRIPS    CONSTRUCTION    HANDLING                                          ORCHARD    DAYS      STRUCTURE     BANK
 TRAVELED  LTO CYC     LAND AREA     & STORING      AREA    QUANT     AREA    QUANT      HEATERS    FIRED       FIRES        SIZE    NUM

 0000050    00100        02250         00350       0001575  050      021950   225         0001      30.0         1230       005450   190


C O M M E N T S

PRODUCED BY THE CDHS EMISSION INVENTORY SUBSYSTEM.
```

NEDS Area Source Report Example
Retrieval Run 1 of EIS/P&R Test Package
Figure 4.5-2 (continued)

4.5.1 ORGANIZATION

The following are the main modules of the NEDS Area Source Report program.

- MAIN-LOOP

  This routine is performed by ROOT-SEGMENT until an end of file is detected on the NEDS file. The NEDS record is edited and, if no severe errors are found, formatted and listed.

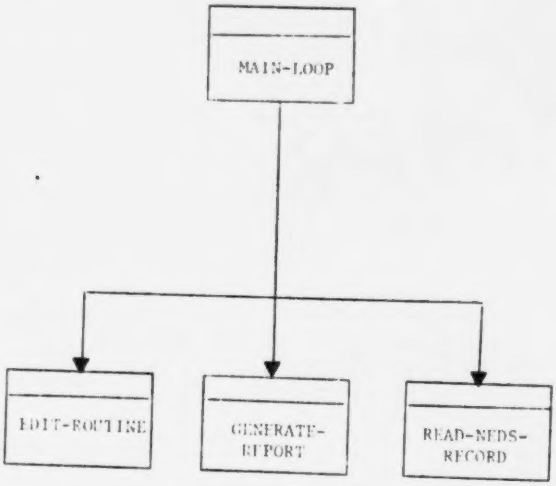
- EDIT-ROUTINE

  This routine edits each of the six different types of NEDS records. A diagnostic message is issued for each error found. If invalid data on the NEDS cards is encountered, the record is rejected.

- GENERATE-REPORT

  This routine formats and lists all NEDS records passed by the EDIT-ROUTINE.

Figure 4.5.1 illustrates the organization of HXANREPT.


MAIN-LOOP
EDIT-ROUTINE
GENERATE-REPORT
READ-NEDS-RECORD

HXANREPT Organization
Figure 4.5.1

4.5.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE fields are the major control flags internal to the NEDS Area Source Report program.

- ERROR-FOUND-SW - Used by MAIN-LOOP to determine if EDIT-ROUTINE has detected any serious errors in the NEDS record (ERROR-FOUND-SW = 1).
- END-OF-FILE-SW - Used by ROOT-SEGMENT to determine when all NEDS records have been processed (END-OF-FILE-SW = 1).

4.5.3 ROUTINES

There are no major subroutines in this program.

4.5.4 DIAGNOSTIC MESSAGES

The following are the diagnostics that may be generated by the NEDS Area Source Report program.

Message: Invalid NEDS card number - (not 1 through 6).
Meaning: Only NEDS card numbers 1-6 are recognized. Any other character is invalid.
Action: Correct error and resubmit transaction.

Message: NEDS card number not numeric.
Meaning: A non-numeric character is in the NEDS card number field.
Action: Correct error and resubmit transaction.

Message: Card out of sequence (key not equal AA1 key).
Meaning: A card is not in the group of NEDS 1-6 cards having the same key.
Action: Correct error and resubmit transaction.

Message: Card is not NEDS Area Source.
Meaning: Card is not in NEDS area source format.
Action: Correct error and resubmit transaction.

Message: Sulfur content contains non-numeric data.
Meaning: This is a numeric field.
Action: Correct error and resubmit transaction.

Message: Ash content contains non-numeric data.
Meaning: This is a numeric field.
Action: Correct error and resubmit transaction.

Message: Days fired contains non-numeric data.
Meaning: This is a numeric field.
Action: Correct error and resubmit transaction.

5.0 DATA CONVERSION PROGRAMS

There are two conversion programs which convert other types of data to EIS/P&R format. These are the NEDS Point Source to EIS/P&R and the NEDS Area Source to EIS/P&R.

5.1 NEDS POINT SOURCE TO EIS/P&R

This program converts NEDS point source input to the EIS/P&R transaction card format. The one (1) card in the NEDS point source input creates the EIS/P&R zero (0) record transaction cards. Cards two (2) through (5) in the NEDS point source input create the EIS/P&R one (1) record transaction cards. The six (6) card in the NEDS point source input creates the EIS/P&R two (2) record transaction cards.

All data items in the EIS/P&R transaction records, which have no corresponding data items in the NEDS input records, are set to blanks with the exception of the following:

1. SET-ID (SEGMENT-1-ID) - Set to the same value as the NEDS POINT-ID.

2. POLLUTANT-ID - 5-digit parameter codes are given to pollutants reported in NEDS input data. These codes are taken from the SAROAD Parameter Coding Manual, EPA Publication No. APTD-0633.

3. SEGMENT-2-ID - Initialized to 5 and incremented by 5 for each AP6 card. (2 digits)

4. EMISSION-FACTOR-SOURCE (EF-SOURCE) - A 1-byte code telling the Emission Factor program to provide POLLUTANT-IDs. Set to A for the Emission Factors Insertion program.

All input cards not containing the point source code and point source input card numbers ranging from one (1) to six (6) are rejected and listed as invalid.

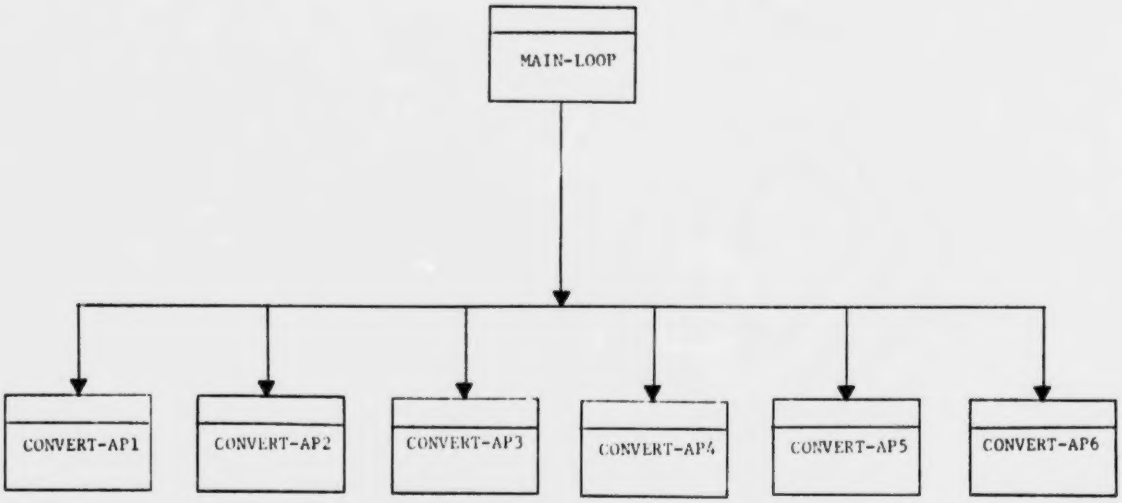
5.1.1 ORGANIZATION

The following are the main modules of the NEDS Point Source to EIS/P&R Conversion program:

- MAIN-LOOP
  This routine is performed by ROOT-SEGMENT until an end of file is detected on the NEDS file. This routine determines the record type and invokes the appropriate conversion routine. If the record type is invalid, a diagnostic message is printed and processing continues with the next NEDS record.

- CONVERT-AP1 through CONVERT-AP6
  Each type of NEDS record has its own conversion routine. In general, these routines accumulate the information contained in the NEDS records until sufficient information is available to generate the EIS/P&R transaction sets. At that point, the appropriate transaction generation routines are invoked.

Figure 5.1 illustrates the organization of CXNEDSCV.


MAIN-LOOP
CONVERT-AP1
CONVERT-AP2
CONVERT-AP3
CONVERT-AP4
CONVERT-AP5
CONVERT-AP6

CXNEDSCV Organization
Figure 5.1.1

5.1.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE fields are the major control flags internal to the NEDS Point Source to EIS/P&R Conversion program.

- END-OF-FILE-SW - Used by the ROOT-SEGMENT to determine when all records from the NEDS file have been written (END-OF-FILE SW = 1).
- GEN-1-SET-SW - Used primarily by the conversion routines to determine when sufficient information has been accumulated to allow the generation of the EIS/P&R transaction sets (GEN-1-SET-SW = 1).
- CARD-13-WRITTEN-SW - Used by the EIS/P&R transaction set 1 generation routine to determine whether the pollution data extraction routine has generated any 13 transactions. If it has not, a dummy 13 transaction is written to the output file (GEN-13-WRITTEN-SW = 0).

5.1.3 ROUTINES

The following are major subroutines of the NEDS Point Source to EIS/P&R Conversion program.

- EXTRACT-POLLUTANT-DATA

  This routine extracts any information present relating to each of the five pollutants contained in NEDS and places it in EIS/P&R 13 transactions. If no information is present on any of the pollutants, no 13 transactions are written by this routine.

- GENERATE-0-SET

  This routine generates the EIS/P&R set 1 transactions from the information contained in the AP2 through AP5 cards.

- GENERATE-2-SET

  This routine generates the EIS/P&R set 2 transactions from the information contained in the AP6 card.

5.1.4 DIAGNOSTIC MESSAGES

The following are the diagnostics that may be generated by the NEDS Point Source program.

Message: Scanning to next AP1 card.
Meaning: This is not an error, but a diagnostic message telling what the computer is doing. It normally follows one of the messages below.
Action: No action necessary.

Message: Invalid NEDS card ID - record rejected.
Meaning: An error exists in the NEDS card ID.
Action: Correct error and resubmit transaction.

Message: Key not equal to key of AP1 card - record rejected.
Meaning: A NEDS card is included having a different ID than the AP1 card for that set.
Action: Correct error and resubmit transaction.

Message: Card out of sequence - record rejected.
Meaning: Cards must be sorted and be in proper sequence before being processed. (See subsection 4.2.1 for sort sequence)
Action: Correct error and resubmit transaction.

5.2 NEDS AREA SOURCE TO EIS/P&R

This program converts NEDS area source input to the EIS/P&R transaction card format, which can be processed by the EIS/P&R File Maintenance program. The first five (5) area source input cards (A1, A2, A3, A4, A5) are all required to generate the EIS/P&R transaction records. The A6 input card is read, but not processed by the program.

All data items in the EIS/P&R transaction records which have no corresponding data items in the NEDS input records are set to blanks with the exception of:

1. USER-PLANT-ID - A literal of 'AREA SOURCE' is placed in this field.
2. PLANT-ID - PLANT-ID is set to 9999, since the lowest level addressed is the Area Quality Control Region (AQCR).
3. NUMBER-OF-EMPLOYEES - This field is filled by the value in the county population field of the three (3) cards in NEDS area source input.
4. SET-ID - SET-ID is initialized to 01 and incremented sequentially by 1 for each emission category reported on the NEDS area source input records (e.g., RESIDENTIAL FUEL = 01, COMMERCIAL AND INSTITUTIONAL FUEL = 02, INDUSTRIAL = 03, etc.)
5. NEDS-POINT-ID - The NEDS-POINT-ID is set to 99, since the AQCR is again the smallest area reported on (2 digits).
6. USER-POINT-ID - There are 13 USER-POINT-IDs corresponding to the 13 major categories reported in NEDS area source input (3 digits).

901 - RESIDENTIAL FUEL
902 - COMMERCIAL AND INSTITUTIONAL FUEL
903 - INDUSTRIAL FUEL
904 - ON SITE INCINERATION
905 - OPEN BURNING
906 - GASOLINE FUEL
907 - DIESEL FUEL
908 - AIRCRAFT
909 - VESSELS
910 - EVAPORATION
911 - MEASURED VEHICLE MILES
912 - MISCELLANEOUS DUST
913 - MISCELLANEOUS BURNING

7. SIC - SIC is set to 9999 (4 digits).

8. IPP - IPP is set to 99 (2 digits).

9. POLLUTANT-ID - POLLUTANT-ID is given the 5-digit code from the SAROAD Parameter Coding Manual, EPA Publication No. APTD-0633 representing the five major pollutants reported.

10. ESTIMATION METHOD - ESTIMATION METHOD is set to '3' indicating that emissions are to be calculated.

11. SCC - SCC codes are supplied by the program reflecting the area code, SCC-ID, sulfur indicator, and ash indicator.

12. FUEL PROCESS SOLID WASTE RATE - The value here will be the value found in each fuel reported under the major emission categories.

An area is divided into 13 categories (a category can be equated to a pollutant source). These categories and the associated fuels or pollutant sources are identified in Table 5.2-1. This becomes the basis for the Area Source conversion; i.e., on this basis, EIS/P&R format records are generated which describe the area and provide information which can be used by EIS/P&R File Maintenance to calculate estimated emissions by pollutant. The contents of the EIS/P&R transaction records are described in Table 5.2-2.

Category	EIS/P&R (USER-POINT-ID)	Fuel/Pollutant Source	(AREA) SCC
Residential Fuel	901	Anthracite Coal	90100111
		Bituminous Coal	90100222
		Distillate Oil	90100330
		Residual Oil	90100440
		Natural Gas	90100500
		Wood	90100600
Commercial and Institutional Fuel	902	Anthracite Coal	90200111
		Bituminous Coal	90200222
		Distillate Oil	90200330
		Residual Oil	90200440
		Natural Gas	90200500
		Wood	90200600
Industrial Fuel	903	Anthracite Coal	90300111
		Bituminous Coal	90300222
		Coke	90300700
		Distillate Oil	90300330
		Residual Oil	90300440
		Natural Gas	90300500
		Wood	90300600
		Process Gas	90300800
On-Site Incineration	904	Residential	90401100
		Industrial	90401200
		Commercial/Institutional	90401300
Open Burning	905	Residential	90501100
		Industrial	90501200
		Commercial/Institutional	90501300
Gasoline Fuel	906	Light Vehicle	90602100
		Heavy Vehicle	90602200
		Off Hiway	90602300
Diesel Fuel	907	Heavy Vehicle	90702200
		Off Hiway	90702300
		Rail Locomotive	90702400

AREA SOURCE CATEGORIES
Table 5.2-1

AREA SOURCE CATEGORIES
Table 5.2-1 (Continued)

Category	EIS/P&R (USER-POINT-ID)	Fuel/Pollutant Source	(AREA) SCC
Aircraft	908	Military	90803100
		Civil	90803200
		Commercial	90803300
Vessels	909	Anthracite Coal	90900111
		Diesel Oil	90904230
		Residual Oil	90900440
		Gasoline	90904430
Evaporation	910	Solvent Purchased	91005100
		Gasoline Marketed	91005200
Measured Vehicle Miles	911	Limited Access Roads	91106100
		Rural Roads	91106200
		Suburban Roads	91106300
		Urban Roads	91106400
Miscellaneous Dust	912	Dirt Roads Traveled	91207100
		Dirt Air Strips	91207200
		Construction Land Area	91207300
		Rock Handling & Storing	91207400
Miscellaneous Burning	913	Forest Fires	91308100
		Slash Burning	91308200
		Frost Control	91308300
		Structure Fires	91308400
		Coal Refuse Burning	91308500

CARD 01:

FIELD	CONTENTS
State	NEDS State
County	NEDS County
AQCR	NEDS AQCR
Plant ID	9999
Date of Record	NEDS Year of Record-Day 000
User Plant ID	AREA SOURCE
Own	NEDS Density
Action	NEDS Action
Card Number	01
All Other Fields	Blanks

CARD 02:

FIELD	CONTENTS
State through Date of Record	Same as Card 01
Number of Employees	NEDS County Population
Action	NEDS Action
Card Number	02
All Other Fields	Blanks

CARD 03:

FIELD	CONTENTS
State through Date of Record	Same as Card 01
Action	NEDS Action
Card Number	03
All Other Fields	Blanks

EIS/P&R AREA SOURCE RECORDS
Table 5.2-2

CARD 11:

FIELD	CONTENTS
State through Date of Record	Same as Card 01
Set ID	Emission Source Count Internally Generated
Point ID - NEDS	99
Point ID-User	Category Code
SIC	9999
IPP	99
Action	NEDS Action
Card Number	11
All Other Fields	Blank

CARD 12

FIELD	CONTENTS
State through Set ID	Same as Card 11
Action	NEDS Action
Card Number	12
All Other Fields	Blanks

CARD 13:

FIELD	CONTENTS
State through Set ID	Same as Card 11
Pollutant ID	Pollutant ID Cod Particulates - 11101 SO2 - 42401 NOX - 42602 HC - 43101 CO - 42101
Estimate Control Efficiency	000
Estimation Method	3
Action	NEDS Action
Card Number	1
All Other Fields	Blanks

EIS/P&R AREA SOURCE RECORDS
Table 5.2-2 (Continued)

CARD 21:

FIELD	CONTENTS
State through segment 1 ID	Same as Card 11
Segment 2 ID	Internally Generated Segment Count
SCC	
Fuel, Process, Solid Waste	NEDS Fuel/Pollution times Heat Content if not zero
Percent Sulfur	NEDS Percent Sulfur
Percent Ash	NEDS Percent Ash
Heat Content	Zero or NEDS quantity (Forest fires, slash burning, frost control and coal refuse burning)
Action	NEDS Action
Card Number	21
All Other Fields	Blanks

CARD 22:

FIELD	CONTENTS
State through Segment 2 ID	Same as Card 21
Action	NEDS Action
Card Number	22
All Other Fields	Blanks

CARD 23:

FIELD	CONTENTS
State through Segment 2 ID	Same as Card 21
Action	NEDS Action
Card Number	23
All Other Fields	Blanks

EIS/P&R AREA SOURCE RECORDS
Table 5.2-2 (continued)

A single set of NEDS area source records can cause many EIS/P&R transaction records to be generated. A set of EIS/P&R type one records are generated for each category having at least one fuel value. This includes five 13 records; i.e., one for each of the five pollutants. Then for each set of type one records, a set of type two records is generated for each fuel value within that category. For this reason it is recommended that NEDS Area Source data be utilized as the source for generating the EIS/P&R area source file. Furthermore, it also is recommended that area source file maintenance be accomplished by coding the data using the NEDS area source load sheets and have the conversion program generate the EIS/P&R transactions.

5.2.1 ORGANIZATION

The following are the main routines of the NEDS Area Source to EIS/P&R Conversion program.

- CONVERT-NEDS-AREA-DATA - This routine controls the reading of an Area Source set of records and the generation of EIS/P&R transactions when a complete set has been read. This routine is performed by ROOT-SEGMENT until the input file has been exhausted.

- READ-A-NEDS-CARD - This routine reads a NEDS Area record, logs it on the printer, moves the record into working storage, and sets the appropriate indicator. This routine is performed by CONVERT-NEDS-AREA-DATA.

- GEN-EIS-TRANS - This routine initializes the output records and controls processing of the zero, one, and two EIS/P&R records. This routine is performed by CONVERT-NEDS-AREA-DATA.

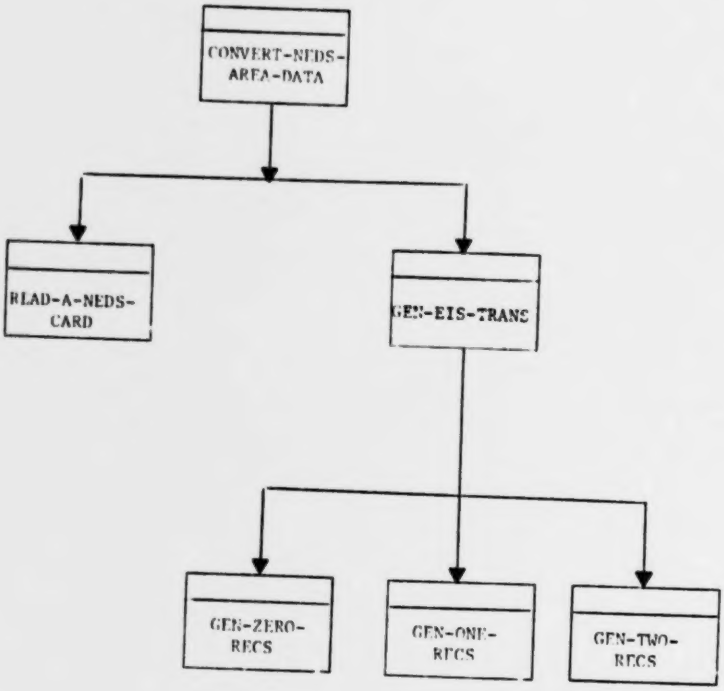
- GEN-ZERO-RECS - This routine sets all values for the EIS/P&R 01, 02, and 03 cards. It also causes the records to be output. This is performed by GEN-EIS-TRANS.

- GEN-ONE-RECS - This routine sets all values for the EIS/P&R 11, 12, and 13 records. Note 13 records are produced for each of the five pollutants. Each record generated is caused to be written. This is performed by GEN-EIS-TRANS.

- GEN-TWO-RECS - This routine sets all values for the EIS/P&R 21, 22, and 23 records. Each record generated is caused to be written. This is performed by GEN-EIS-TRANS.

- WRITE-ROUTINE - This is the lowest level routine. It logs the EIS/P&R record on the printer and writes it to be processed in the next File Maintenance step.

Figure 5.2.1 illustrates the organization of DXNEDSAS.


CONVERT-NEDS-AREA-DATA
READ-A-NEDS-CARD
GEN-EIS-TRANS
GEN-ZERO-RECS
GEN-ONE-RECS
GEN-TWO-RECS

DXNEDSAS Organization
Figure 5.2.1

5.2.2 COMMUNICATION AND DATA FORMATS

The following defines the usage of certain COBOL WORKING-STORAGE names:

- CARD-STORAGE-AREA - is used for storage of and describes the format of the NEDS area source records.
- TRANS-NN - is used for storage of and describes the format of the EIS/P&R records.
- AREA-INDICATORS - is used to designate presence of a NEDS area source record. There is one indicator per NEDS record (5). Zero indicates no record present. One indicates a record present.
- SET-REC-KEY-BUC - is a working area for building a record key.
- PROCESS-TABLE - is a Table of SCCs. There is a one to one relationship between the entries in this table and the fuel/pollutant values in the NEDS area source records. The table is most critical to the conversion program. Though the codes were generated arbitrarily, they have significance as follows:

  SCC Format AAABBBCD

  A - Corresponds to the category code (see Table 5.2-1)

  B - Fuel/Pollution Source Code as follows:

Code	Fuel
001	Anthracite Coal
002	Bituminous Coal
003	Distillate Oil
004	Residual Oil

005	Natural Gas
006	Wood
007	Coke
008	Process Gas
011	Residential
012	Industrial
013	Commercial/Institutional
021	Light Vehicle
022	Heavy Vehicle
023	Off Hiway
024	Rail Locomotive
031	Military
032	Civil
033	Commercial
042	Diesel Oil
044	Gasoline
051	Solvent Purchased
052	Gasoline Marketed
061	Limited Access Roads
062	Rural Roads
063	Suburban Roads
064	Urban Roads
071	Dirt Roads Traveled
072	Dirt Air Strips
073	Construction Land Area
074	Rock Handling & Storing
081	Forest Fires
082	Slash Burning
083	Frost Control
084	Structure Fires
085	Coal Refuse Burning

C - Sulfur Code as follows:

Code	Fuel
0	No Sulfur
1	Use % Anthracite Coal
2	Use % Bitumous Coal
3	Use % Distillate Oil
4	Use % Residual Oil

D - Ash Code as follows:

Code	Fuel
0	No Ash
1	Use % Anthracite Coal
2	Use % Bitumous Coal

5.2.3 ROUTINES

There are no major subroutines in this program.

5.2.4 DIAGNOSTIC MESSAGES

There are no diagnostic messages generated by this program.

6.0 EMISSION FACTORS TABLE PROGRAMS

There are three programs to facilitate the creation, maintenance and use of the emissions factors tables. These are the Emissions Factors Table Generator, Emission Factors Transaction Generator and Emission Factors Insert programs.

6.1 EMISSION FACTORS TABLE GENERATOR

The Emission Factors Table Generator component creates a 2-page (two physical records) Emission Factors Table from an input data set containing SCC numbers and emission factor values. The first page of the table, the SCC index page, contains an entry for each type 1 card in the input data set. The type 1 card contains the SCC number, the effective date of the SCC and the ash and/or sulfur percentages associated with this SCC. Two additional items generated by this component are added to each SCC index entry. They are the number of emission factor values assigned to the SCC and an index pointer to their location in the emission factor value page.

The second page of the table, the emission factor value page, contains an entry for each type 2 card in the input data set. The type 2 card contains the SCC number to which this emission factor value is assigned, a pollution identification number, the emission factor value and two code values, the units of measure code, and the ash/sulfer indicator code.

The generated table has a capacity of 800 SCC numbers and 1200 emission factor values. There may be up to 16 emission factor values for an individual SCC.

The emission factors table is generated from card input. There are two types of cards and they may be arranged in any order convenient to the user. The table capacity is 800 SCC numbers and 1200 emission factors. The two card formats are the SCC card format (type 1) and the emission factor card format (type 2).

- SCC Card Format

  There must be one of these cards for each SCC number which is to be entered into the table. The format is:

Cols 1-8	SCC Number
Cols 9-13	Date of SCC Julian Format (YYDDD)
Cols 14-16	Ash Percentage (one assumed decimal place-XX.X)
Cols 17-19	Sulfer Percentage (Two assumed decimal places-X.XX)
Cols 79	1

SCC	DATE	ASH	SUL		1	
1 8	9 13	14 16	17 19		79	

- Emission Factors Card Format

There may be from 1 to 16 of these cards for each SCC number. The format is:

Cols 1-8	SCC Number
Cols 9-13	Pollutant Identification Number
Cols 14-22	Emission Factor (three assumed decimal places-XXXXXX.XXX)
Col 23	Units of Measure Code
Col 24	Ash/Sulfur (contains an A or S)
Col 79	2

SCC	POLL. ID	EM. FACT.	UNIT	A/S		2	
1 8	9 13	14 22	23	24		79	

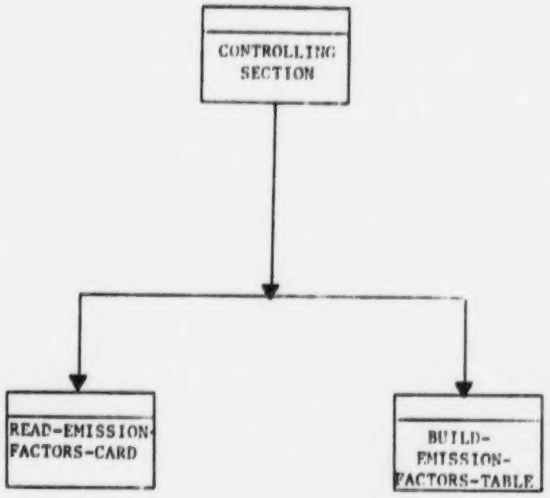
6.1.1 ORGANIZATION

The Emission Factors Table Generator component is organized as a control segment with two subordinate routines. The controlling segment opens data sets, gives control to the SORT statement which in turn calls the input procedure and the output procedure, and finally closes the data sets. Following are the main routines of the Emission Factors Table Generator component.

- READ-EMISSION-FACTORS-CARDS - This is the input procedure of the SORT statement. The input procedure reads a card from the input data set, checks the card for correct content and type, and then gives the card to SORT. This is performed until end of file on the input file.

- BUILD-EMISSION-FACTORS-TABLE - This is the output procedure of the SORT statement. The output procedure reads a card from the sorted data set, identifies it as to type, and builds the appropriate table entry. When the entry is processed, the emission factors table is written on the output data set. This is performed until end of file on the sorted data set.

Figure 6.1.1 illustrates the organizations of TXTBLGEN.


CONTROLLING SECTION
READ-EMISSION-FACTORS-CARD
BUILD-EMISSION-FACTORS-TABLE

TXTBLGEN Organization
Figure 6.1.1

6.1.2 COMMUNICATION AND DATA FORMATS

The following defines the usage of certain COBOL WORKING-STORAGE names:

- EOFSW - May contain TRUE or FALSE. If true, a data set end-of-file has been detected.
- ERRSW - May contain a TRUE or FALSE. If true, an error has been detected during the read cards routine processing.
- FRDSW - May contain a TRUE or FALSE. If true, the first SCC index entry is not to be moved until the number of emission factor values has been determined.
- EMFI-INDEX - Contains a count of type 1 cards read during the read cards routine and the subscript of the next SCC index entry during the build table routine.
- EMFT-INDEX - Contains a count of type 2 cards read during the read cards routine and the subscript of the next EF table entry during the build table routine.

6.1.3 ROUTINES

The following are internal routines of the Emission Factors Table Generator program.

- PROCESS-EMF-CARDS - This paragraph reads a card from the input data set, determines the card type, and passes control to paragraph PROCESS-CARD-INVALID-ERROR, PROCESS-CARD-TYPE1, or PROCESS-CARD-TYPE2.

- PROCESS-CARD-INVALID-TYPE - This paragraph issues an error message when invalid card is detected.

- PROCESS-CARD-TYPE1 - This paragraph processes the SCC number card. All fields of the SCC number card are checked for content, and the card is then released to COBOL sort. This paragraph issues an error message for incorrect field content or when the SCC index table capacity is exceeded.

- PROCESS-CARD-TYPE2 - This paragraph processes the emission factor value card. All fields of this card are checked for content, and the card is then released to COBOL sort. This paragraph issues an error message for incorrect field content or when emission factor value table capacity is exceeded.

- ERROR-ROUTINE - This paragraph writes an error message on the list/error data set. An error flag is turned on upon entry to this paragraph.

- BUILD-TABLE-ENTRIES - This paragraph reads a card from the sorted data set by means of the RETURN statement. The card type is determined and control is passed to either paragraph BUILD-INDEX-ENTRY or BUILD-TABLE-ENTRY.

- BUILD-INDEX-ENTRY - This paragraph converts the SCC number card field content to table format and puts the entry into the next available index entry table position.

- OUTPUT-EMISSIONS-FACTORS-TABLE - This paragraph moves the two table pages from working storage to an output buffer and then writes the table pages on the output table data set. Paragraphs OUTPUT-INDEX-ENTRY and OUTPUT-TABLE-ENTRY are performed to list the contents of the two table pages.

- OUTPUT-INDEX-ENTRY - This paragraph lists all the entries in the SCC index table page.

- OUTPUT-TABLE-ENTRY - This paragraph lists all the entries in the emission factor value table page.

- ERROR-ROUTINE-1 - This paragraph writes an error message on the list/error data set.

6.1.4 DIAGNOSTIC MESSAGE

The following diagnostics are generated by the Emission Factors Table Generator program.

Message: Invalid type code.
Meaning: Type 1 and 2 are the only valid cards (cc 79).
Action: Correct error and resubmit transaction.

Message: SCC table size exceeded.
Meaning: A maximum of 810 SCC codes is allowed.
Action: Correct error and resubmit transaction.

Message: Pollutant table size exceeded.
Meaning: A maximum of 1500 emission factor values (Pollutant table) are allowed.
Action: Correct error and resubmit transaction.

Message: Excessive pollutants for SCC.
Meaning: A maximum of 16 emission factor values (pollutant) are allowed for each SCC.
Action: Correct error and resubmit transaction.

Message: SCC number invalid.
Meaning: SCC number is in error. Contains non-numeric characters.
Action: Correct error and resubmit transaction.

Message: Date invalid.
Meaning: The Julian date (YYDDD) is in error. Contains alphabetic characters.
Action: Correct error and resubmit transaction.

Message: Ash percentage invalid.
Meaning: An error exists in the ash content field. (Should contain numeric only.)
Action: Correct error and resubmit transaction.

Message: Sulfur percentage invalid.
Meaning: An error exists in the sulfur content field. (Should be numeric only.)
Action: Correct error and resubmit transaction.

Message: Pollutant number invalid.
Meaning: Contains non-numeric characters.
Action: Correct error and resubmit transaction.

Message: Emission factor invalid.
Meaning: Contains non-numeric characters.
Action: Correct error and resubmit transaction.

Message: No pollutants for SCC.
Meaning: Pollutants must be included for each SCC.
Action: Correct error and resubmit transaction.

6.2 EMISSION FACTORS TRANSACTION GENERATOR

The Emission Factors Transaction Generator generates transactions to update the EIS/P&R Master File automatically. To accomplish this task, the inputs to this program must be an EIS/P&R Master File, an Emission Factors Table, and an input control card. These must each have certain information in them to create the transactions for update.

The Emission Factors Table must have a date associated with each SCC in the table. This date will be used as one factor to determine whether insertion should be attempted.

The control card format is:

```
|   SCC DATE (YYDDD)  |  |Mode|                |
    1                5    7
```

The date on the control card is the second factor used to determine whether insertion should be attempted. The mode on the control card will tell what type of insertion will be used if the decision to attempt insertion has been made. The allowable modes are (A or X), unconditional insertion or (T or N), selective insertion. If mode is blank, the mode defaults to T.

These dates, one on the control card and one for each SCC in the Emission Factors Table, and the mode are used in the following way. The program reads the logical records of an existing data set (the type 1 record and all type 2 records associated with it) of the EIS/P&R Master File. Each type 2 record which is associated with the type 1 set will be examined for a match of SCC of the EIS/P&R Master File type 2 record and the emission factors table. If there is no SCC match, no further checks are made on the record and the record remains untouched. If a match of SCC in the table and the record (type 2) occurs, a further check of the date check is made. The date of the SCC in the Emission Factors Table is compared to the date on the control card to determine if the date of the SCC in the Emission Factors Table is equal to or greater than the control card date. If this date check fails (table SCC date less than control card date), the record remains untouched. Otherwise, if the date check is true (table SCC date equal to or greater than control card date), the corresponding values from the Emission Factors Table will be inserted according to the mode specified on the control card.

The unconditional mode (A or X) will insert all emission factor values associated with the SCC match (the values are taken from the table) into the repetition of the type 2 record. This will overlay the old values from the EIS/P&R File. The conditional mode (T or N) additionally checks the pollution identification number in the type 2 record repetitions (in the EIS/P&R File) for a match with a pollution identification number in the already matched SCC entry of the table. Insertion in the conditional mode, then, only takes place if this match of pollution identification number is made. More detail on the modes follows. In either mode, if any insertion takes place on the set, the transactions for file update are generated.

Following are further details on each mode. Insertion by any of these modes will only be attempted if the SCC in the file matches an SCC in the table and the date check is passed (date in match SCC in table equal to or greater than the control card date).

Conditional Modes

T Mode: In this mode, the program will perform insertion on all type 2 records which meet the match of SCC, the date criteria, and, also if EF-SOURCE in the Master File (corresponding to column 50, Card 22) is T, match of pollutant identification between the type 2 record and the SCC-related entries in the Emission Factors Table. The program examines the EF-SOURCE field of the type 2 Master File record for a T. If not T, the type 2 record is left untouched; if T, the Emission Factors Table is searched for a match of pollutant identification with the type 2 record using the pointer from the matched SCC entry in the table. Each pollutant identification number in the type 2 record is checked for a match in the entries pointed to by the matched SCC entry of the table. If a match of pollutant identification is found, the emission factor units of measure code, and the A/S (ash-sulfur) flag are inserted into that repetition of the 23 transaction.

N Mode: In this mode, the program will insert emission factors into all type 2 records which need the match of SCC, the date criteria, and match of pollutant identification in the type 2 record and the SCC-related entries in the Emission Factors Table, without regard to the value of EF-SOURCE. The operation of the pollutant identification check for type 2 records is identical to the T mode except that EF-SOURCE is disregarded.

Unconditional Modes

A Mode: In this mode, insertion takes place unconditionally in all type 2 records with matching SCC codes and which meet the date criteria. Both the EF-SOURCE check and the pollutant identification number search of the type 2 record, as defined in the conditional modes, are disregarded.

X Mode: In this mode, insertion takes place unconditionally in all type 2 records with matching SCC codes and which meet the date criteria. Additionally, a match of pollutant identification between type 1 and type 2 records is made to ensure that all pollutant identification numbers inserted in the type 2 records exist in the type 1 record. If all do not exist in the type 1 record, additional repetitions will be added to the type 1 record to accommodate the non-matched from the type 2 record.

From a functional viewpoint each mode accomplishes certain tasks. The user should examine his aims and use the appropriate mode. Examples of some specific cases follow:

a. Mode A should be used whenever the user desires to unconditionally update emission factors in the Master File. The user must be aware that the emission factors associated with an SCC in the Emission Factor Table will completely replace all emission factors associated with the same SCC in the Master File. If these are emission factors which the user wishes to keep in the Master File which are not in the Emission Factors Table, a selective mode such as T or N should be used.

b. Mode X should be used to modify and add emission factors to sources in the Master File when the possibility exists that more pollutants are carried in the type 2 segments than are carried in the type 1 segment. This condition could exist when new pollutants are added to an SCC in the Emission Factors Table. After insertion in mode X, every pollutant in the type 2 segments will have a corresponding entry in the type 1 segment. Mode X can also be used to insert emission factors for updating a Master File that was created before an Emission Factors Table was available.

c. Mode T should be used to modify emission factors for selected sources in the Master File. Sources for which emission factor modifications are selected should be indicated by "T" in the EF-SOURCE field of the Master File record. This mode also can be used when some sources in the Master File contain locally derived emission factors. These would not be subject to any modifications from the official table. Sources using locally derived emission factors should contain a blank in EF-SOURCE in the Master File.

d. Mode N should be used to update emission factors for those pollutants existing in the source records of the Master File without regard to the value of EF-SOURCE.

TEST PERFORMED	MODE OF OPERATION			
	A	X	T	N
DATE CHECK	X	X	X	X
SCC MATCH	X	X	X	X
POLLUTANT-ID MATCH			X	X
EF-SOURCE = "T"			X	
SUMMARY OF ACTION TAKEN	Transfer all factors in Table to EIS/P&R transactions	Transfer all factors to EIS/P&R transactions and check for proper pollutant-ID's in point segment. Add missing pollutant-ID's to type 1 segment.	Transfer factors for matching pollutant-ID's from table to EIS/P&R transactions if EF-SOURCE = "T"	Transfer factors for matching pollutant-ID's from Table to EIS/P&R transactions

Figure 6.2 SUMMARY OF MODES OF OPERATION AND ACTIONS

6.2.1 ORGANIZATION

The Emission Factors Transaction Generator consists of four modules controlling the main logic and one module which is called to process the Master File. The Master File processor employs three major routines also.

- READ-DATE-CARD - reads the user-supplied control card and saves the appropriate information in core. A read error will terminate the program.

- READ-EMISSION-FACTORS-TABLE - reads the Emission Factors Table into core and sets some initialization. A read error will terminate the program.

- PROCESS-DATA-FILE - gets the first record from the Master File and calls PROCESS-FILE-LOGICAL-RECORD to be performed until end of file. PROCESS-FILE-LOGICAL-RECORD controls the output of the transactions if they are to be generated.

- STOP-RUN - closes the data sets and terminates the run.

- PROCESS-FILE-LOGICAL-RECORD - is performed until end of file on the Master File is reached to control the processing of the Master File. The GET-LOGICAL-RECORD routine is called to get a logical set of type 1 and type 2 records and to perform the emission factor insertion if the type 2 record qualifies. When control is returned to PROCESS-FILE-LOGICAL-RECORD an indicator ADDSW is tested. If on, control passes to routines to generate and output the transactions (type 1 transactions, type 2 transactions, and possibly type 3 transactions). If the indicator is off, the logical record and its corresponding type 3 records are skipped because emission factor insertion did not occur.

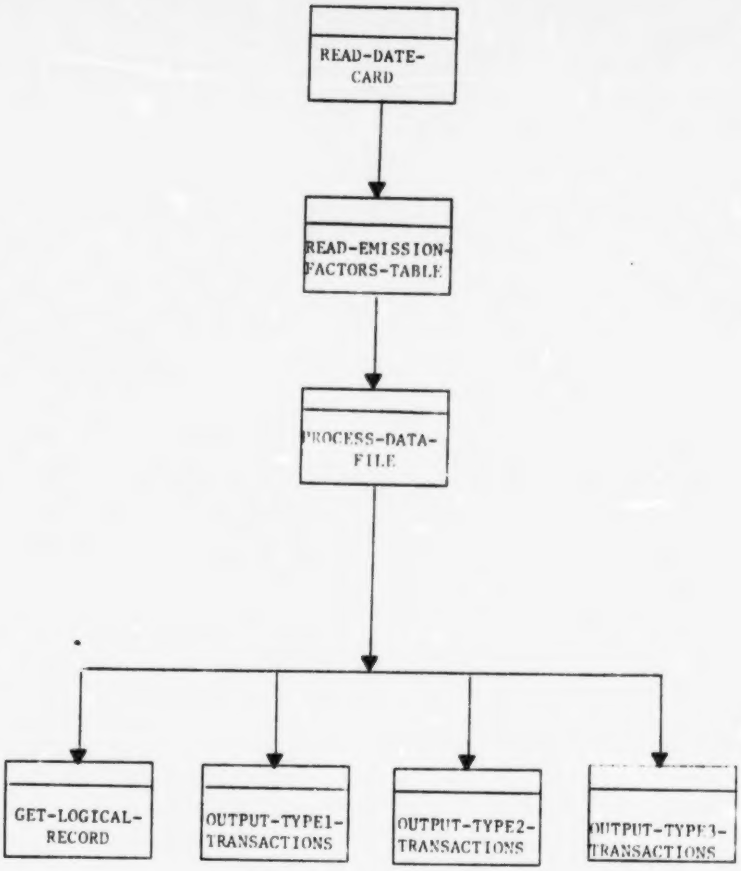
- GET-LOGICAL-RECORD - controls the reading and processing of a logical set of type 1/type 2 records. It performs LGL-RECORD until a set is found to identify the record and process any type 2 transactions using TYPE-2-RECORD-PROCESSING to attempt insertion.

- OUTPUT-TYPE-1-TRANSACTIONS - builds the output transactions for the type 1 record (11D, 11A, 12A, 13A [up to 16]), then calls OUTPUT-TRANSACTION to write each output record.

- OUTPUT-TYPE-2-TRANSACTIONS - builds the output transactions for the type 2 records (21A, 22A, 23A [up to 16 for each set with up to 6 sets]), then calls OUTPUT-TRANSACTION to write each output record.

- OUTPUT-TYPE-3-TRANSACTIONS - builds the output transactions for the type 3 records (30A [up to 99 sets of 999 lines]), then calls OUTPUT-TRANSACTION to write each output record.

Figure 6.2.1 illustrates the organization of EXTRNGEN.


READ-DATE-CARD
READ-EMISSION-FACTORS-TABLE
PROCESS-DATA-FILE
GET-LOGICAL-RECORD
OUTPUT-TYPE1-TRANSACTIONS
OUTPUT-TYPE2-TRANSACTIONS
OUTPUT-TYPE3-TRANSACTIONS

EXTRNGEN Organization
Figure 6.2.1

6.2.2 COMMUNICATION AND DATA FORMATS

The following defines the usage of certain COBOL WORKING-STORAGE names:

- ADDSW - May contain TRUE or FALSE. If true, emission factors were inserted into a type 2 record.
- CHGSW - May contain TRUE or FALSE. If true, an entry was added to the type 1 record repetitions.
- EOFSW - May contain TRUE-FALSE. If true, a data set end-of-file has been detected.
- EXCSW - May contain TRUE or FALSE. If true, the number of entries added to the type 1 record repetitions exceeded the maximum of 16.
- FNDSW - May contain TRUE or FALSE. If true, an SCC number was found in the Emission Factors Table.
- FRDSW - May contain TRUE or FALSE. If true, the first physical record read of the get logical record is not to be performed.
- LGLSW - May contain TRUE or FALSE. If true, the logical record may be processed.
- LGLCSW - May contain TRUE or FALSE. If true, the logical record reading process is complete.
- SCCSW - May contain TRUE or FALSE. If true, the SCC number was found in the Emission Factors Table and the SCC date test passed.
- T1RSW - May contain TRUE or FALSE. If true, the type 1 record repetition count has been initialized.

- T2RSW - May contain a T, N, A, or X. Contains the user-specified emission factor insertion mode of operation.

- RECORD-EXPECTED - Contains the code of the next physical record that should be read.

- RECORD-FOUND - Contains the code of the physical record that was just read.

- ROUTINE-CODE-VALUES - Contains the sequencing control matrix for the get file logical record routine. The RECORD-FOUND and RECORD-EXPECTED codes determine the i_{ij} entry of the matrix. This entry contains the argument of a GO TO DEPENDING ON statement to pass control to the various paragraphs of the GET-FILE-LOGICAL-RECORD routine.

- MSTR-FIXED-SEGMENT - Contains the type 0 record.

- MSTR-POINT-SOURCE - Contains the type 1 record.

- MSTR-MACHINE-PROCESS - Contains a single type 2 record.

- MSTR-REGISTRATION - Contains a single type 3 record.

- MASTER-TYPE-2-SAVE - Contains all the type 2 records belonging to this logical record.

6.2.3 ROUTINES

The following are internal routines of the Emission Factors Table Generator.

- GET-RECORD - This paragraph reads a physical record from the data file and sets a code in RECORD-FOUND indicating the record type.

- LGL-RECORD - This paragraph provides the control logic to read physical records and assemble them into a logical record. This paragraph performs GET-RECORD and then one of the following six paragraphs to process the physical record just read. Paragraph GET-RECORD is not performed upon first entry, since the physical record is already in the buffer. This record was read by the previous get logical record request.

- LGL-RECORD-ERROR - This paragraph is entered when a file sequencing error has been detected. It issues an error message and terminates the run. (See Subsection 6.2.4)

- LGL-RECORD-TYPE0 - This paragraph is entered when a type 0 record has been read. It moves the record to working storage.

- LGL-RECORD-TYPE1 - This paragraph is entered when a type 1 record has been read. It moves the record to working storage and sets up for the type 2 record reading.

- LGL-RECORD-TYPE2 - This paragraph is entered when a type 2 record has been read. It counts the number of type 2 records read and moves the record to working storage. Paragraph SCC-SEARCH is performed to determine if the SCC number is in the Emission Factors Table.

- LGL-RECORD-TYPE3 - This paragraph is entered when the first type 3 record of a logical set has been read. It sets the LGLSW switch to ON.

- LGL-RECORD-COMPLETE - This paragraph is entered when the record just read belongs to the next logical record. The LGLCSW, LGLSW, and FRDSW are set true.

- LGL-RECORD-INCOMPLETE - This paragraph is entered when an end-of-file has been detected on the data file, and the logical record in working storage is incomplete. The LGLCSW is set true, and LGLSW is set false.

- T2RECORD-PROCESSING - This paragraph is on the control routine for the type 2 record processing. It examines the user-specified mode and performs the appropriate paragraphs to accomplish insertion.

- SCC-SEARCH - This paragraph does a binary search of the SCC index entries in the first page of the Emission Factors Table. The SCC number from the type 2 record is used as the search argument. If found and the date check passes, the index entry is saved and the ash and/or sulfur percentage values are inserted into the corresponding fields of the type 2 record.

- POLID-SEARCH-T2RECORD - This paragraph cycles through the pollutant identification numbers in the repetitions portion of the type 2 record. This paragraph is used in conjunction with POLID-SEARCH-EMF-TABLE paragraph to determine if the pollutant identification number in the type 2 record is in the Emission Factors Table.

- POLID-SEARCH-EMF-TABLE - This paragraph searches an Emission Factors Table to determine if a specified pollutant identification number is in the table.

- EMISSION-FACTORS-INSERTION - This paragraph converts an emisssion factor value entry to the transaction form and inserts it into a specified repetition of the type 2 record.

- POLID-INSERTION-T2RECORD - This paragraph replaces all existing emission factor values in the type 2 record repetitions with the emission factor values from the Emission Factors Table.

- POLID-SEARCH-T1RECORD - This paragraph examines all the pollutant identification numbers in the type 2 record and determines if a pollutant identification entry must be created as a new type 1 record repetition.

- OUTPUT-TRANSACTION-ROUTINE - Prints the already formatted record.

6.2.4 DIAGNOSTIC MESSAGES

The following are the diagnostic messages that may be generated by the Emission Factors Transaction Generator program.

Message: File sequencing error.
Meaning: File must be in proper sequence for processing. (See Subsection 7.1 for sort sequence.) This will be in combination with the two messages below.
Action: Correct error and resubmit transaction.

Message: Key of last record.
Meaning: Provides the key of last record before error was encountered.
Action: Use information along with accompanying information to analyze problem and correct error.

Message: Key of error record.
Meaning: Provides key of record in error.
Action: Use information along with accompanying information to analyze problem and correct error.

Message: Read Error Date Card file.
Meaning: An error has occurred while reading the Date Card File or card is missing.
Action: Correct error and resubmit transaction. Have System Engineer (SE) check for error in system.

Message: Read Error Emission Factors File.
Meaning: An error has occurred in reading the Emission Factor File.
Action: Correct error and have SE check for error in system.

Message: Emission entries added.
Meaning: Additional Pollutant IDs added to Segment 1.
Action: No action required.

Message: Excessive pollutants.

Meaning: A maximum of 16 unique pollutant IDs are permitted with each point source.

Action: Correct error and resubmit transaction.

6.3 EMISSION FACTORS INSERTION

The CDHS Emission Factors Insertion program will search the Emission Factors Table using the SCC number as an argument and insert one or more of the associated emission factor values into EIS/P&R file maintenance transactions prior to their input to file maintenance. These transactions can be user supplied or obtained from the file.

To perform this function, this program required the EIS/P&R 21, 22, and one or more 23 transactions. The 21 transaction contains the SCC number to be used as the search argument. The EF-SOURCE field in the 22 transaction may contain a blank or the character A or T. If blank, emission factors insertion does not occur. If A or T, the program will operate in the ALL mode or the TABLE mode respectively. The set of EIS/P&R 21, 22, 23 (one or more) cards must be together and in that order. Any other transactions (01, 11, 12, 13, 30) will be untouched. The transactions, as noted above, must be sorted into a required sequence. This can be accomplished by hand or by the Transaction Sorter program.

Following are further details on each mode:

ALL mode: In this mode, the program will search the Emission Factors Table using the SCC number in the 21 transaction as a search argument and insert all the emission factors that are associated with this SCC number. The ALL mode requires a single 23 transaction to immediately follow the 22 transaction containing the A in EF-SOURCE. The 23 transaction must contain the key fields; the remaining fields are ignored. For each emission factor, a 23 transaction will be constructed by the program from the information supplied by the user's 23 card and from the Emission Factors Table. The data inserted into the 23 transaction will be the pollutant identification number, the emission factor, the emission factor units of measure code, and the A/S (ash/sulfur) percentage flag.

TABLE mode: In this mode, the program will search the Emission Factors Table using the SCC number in the 21 transaction as a search argument and insert only those emission factors whose insertion is requested by a matching pollutant ID in the 23 transaction. The TABLE Mode requires one or more 23 transactions to immediately follow the 22 transaction containing the T in EF-SOURCE. Each 23 transaction must contain from one to three pollutant identification numbers. The pollutant identification number is used to search the list of emission factors associated with the SCC number. If found, the emission factor, the emission factor units of measure code, and the A/S (ash/sulfur) percentage flag are inserted into the 23 transaction.

From a functional viewpoint, each mode accomplishes certain tasks. The user should examine his aims and use the appropriate mode. Examples of some specific cases follow:

a. Mode A should be used for file creation, the addition of new sources, or when it is desired that all emission factors for an SCC be extracted from the table and inserted into the EIS/P&R transactions provided.

b. Mode T should be used to control the insertion of emission factors to ensure pollutant IDs in the EIS/P&R transaction determine the selection of factors from the Emission Factors Table. This mode is particularly useful when non-standard factors are used for some SCCs.

c. A blank in EF-SOURCE should be used when emission factors are locally determined or for situations where manually entered factors should not be replaced by table entries. (Note that if this mode is used, then the user should indicate a T in EF-SOURCE for other SCCs for this point source.)

6.3.1 ORGANIZATION

The following are the main modules of the Emission Factors Insertion program.

- MAIN-LOOP - is performed by ROOT-SEGMENT until all input transactions are processed. READ-ROUTINE is called to read each transaction. If the card is a type 2 transaction, the proper routine, PROCESS-21-CARD, PROCESS-22-CARD, or PROCESS-23-CARD, will be performed. If the card is other than a type 2 transaction, first a check is made by CARD-21-22-CHECK to determine if any 21 or 22 cards are still in core waiting to be written and if so they are output; then the current transaction is output by WRITE-ROUTINE.

- PROCESS-21-CARD - is performed by MAIN-LOOP to move the input transaction into core storage for further processing.

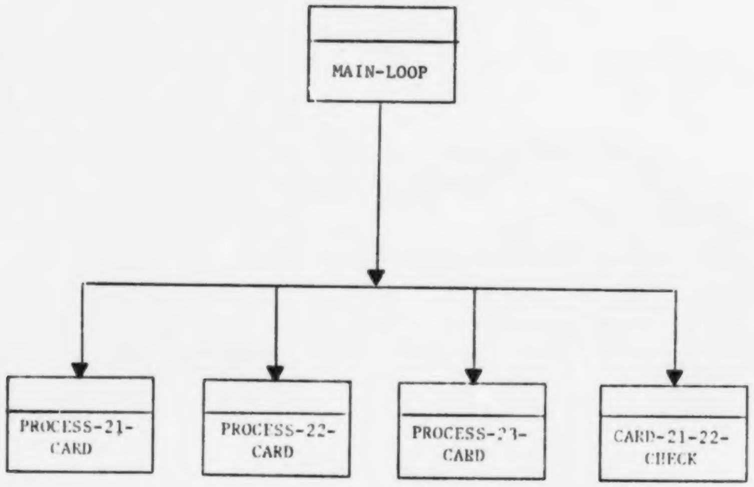
- PROCESS-22-CARD - is performed by MAIN-LOOP to move the input transaction into core storage. If the EF-SOURCE field in this transaction contains an A or T, a search by SEARCH-FOR-SCC is performed; and, if the search is successful, ASH-SULFUR-PC is performed to establish the ash/sulfur percentage.

- PROCESS-23-CARD - is performed by MAIN-LOOP to process the 23 transaction. If the mode is A or T and the SCC was found, insertion will be attempted by either GENERATE-IN-ALL-MODE or GENERATE-IN-TABLE-MODE.

- CARD-21-22-CHK - is performed to determine if any 21 or 22 cards are waiting in core to be output and, if so, calls WRITE-ROUTINE to output either or both of them.

- WRITE-ROUTINE - is performed to output to the newly created Transaction File.

Figure 6.3.1 illustrates the organization of KXEMFINS.


MAIN-LOOP
PROCESS-21-CARD
PROCESS-22-CARD
PROCESS-23-CARD
CARD-21-22-CHECK

KXEMFINS Organization
Figure 6.3.1

6.3.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the Emission Factors Insertion program.

- END-OF-FILE-SW - set to true when the end of file is detected on the Input Transaction File.
- POLID-FOUND-SW - set to true when the pollutant identification is found in the associated entry of the Emission Factors Table by POLID-SEARCH.
- SCC-FOUND-SW - set to true when the SCC is found in the Emission Factors Table by SEARCH-FOR-SCC.
- TRANS-21-WRITTEN-SW - set to true when the current 21 record in core storage has been written.
- TRANS-22-WRITTEN-SW - set to true when the current 22 record in core storage has been written.
- WORK-TRANS-21 - contains the most recently read 21 transaction record.
- WORK-TRANS-22 - contains the most recently read 22 transaction record.
- WORK-TRANS-23 - contains the most recently read 23 transaction record.

6.3.3 ROUTINES

The following are internal subroutines of the Emission Factors Insertion program.

- BUILD-EMF-TABLES - builds in working storage the Emission Factors Table to be used for emission factors insertion.
- CHECK-23-CARD - is performed by GENERATE-IN-TABLE-MODE to generate the information for the pollutant IDs which are found by POLID-SEARCH.
- GENERAT-ALL-23 - is performed by GENERATE-IN-ALL-MODE to produce a 23 transaction for each emission factor associated with the SCC.
- GENERATE-IN-ALL-MODE - is performed by PROCESS-23-CARD to control the generation of 21, 22, and 23 transactions as described in TABLE-MODE.
- POLID-SEARCH - is performed by CHECK-23-CARD to find emission factor values associated with an SCC number in the Emission Factors Table.
- SEARCH-FOR-SCC - is performed by PROCESS-22-CARD to search the SCC index entries of the Emission Factors Table for a match of SCC with the input 21 transaction. If found, a found-flag is set and the index is saved.

6.3.4 DIAGNOSTIC MESSAGES

The following are diagnostic messages that may be generated by the Emission Factors Insertion program:

Message: Error detected reading Emission Factors Table File-run aborted.
Meaning: Error condition exists in EF Table.
Action: Correct errors in table.

Message: SCC number not found in Emission Factors Table-set 2 bypassed.
Meaning: No match found between Transaction File and table.
Action: Enter additional SCCs required.

Message: Invalid segment 2 card (not 21, 22, or 23)-transaction rejected.
Meaning: The segment 2 card is other than 21, 22, or 23.
Action: Correct card number and resubmit.

7.0 SORT-RELATED PROGRAMS

There are three sort or sort-related programs. These are the Transaction Sorter, the Master File Sorter Generator, and the Master File Sorter.

7.1 TRANSACTION SORTER

The CDHS Transaction Sorter program will enable the user to automatically produce an EIS/P&R transaction card file usable (in correct order) by the EIS/P&R File Maintenance program from an input EIS/P&R transaction card file which may be in any order.

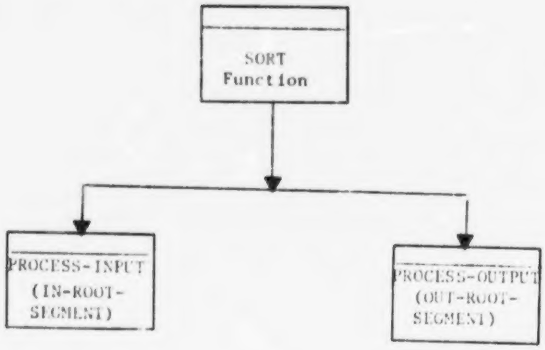
Since the EIS/P&R File Maintenance program makes only one pass through the EIS/P&R Master File, the transaction sorter sorts, in ascending order, on record key, segment-1-ID, segment-3-ID, segment-2-ID, line-number, segment-number, action-code (D,A,C - specific order), and card-number.

7.1.1 ORGANIZATION

The following are the main modules of the Transaction Sorter program.

- PROCESS-INPUT - is the input section for the SORT statement.
- IN-ROOT-SEGMENT - is the paragraph which controls the reading of each record into core storage and performs IN-MAIN-LOOP to build each record key and release the record to the SORT function.
- PROCESS-OUTPUT - is the output section for the SORT statement.
- OUT-ROOT-SEGMENT - is the paragraph which controls the release of the sorted records and the writing of the sorted records to the output transaction file performed by OUT-MAIN-LOOP.

Figure 7.1.1 illustrates the organization of IXTRNSRT.


SORT Function
PROCESS-INPUT (IN-ROOT-SEGMENT)
PROCESS-OUTPUT (OUT-ROOT-SEGMENT)

IXTRNSRT Organization
Figure 7.1.1

7.1.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the Transaction Sorter program.

- END-OF-FILE-SW - set to true when the end of file is detected on the input transaction file or the sorted transaction file.
- ADD-CODE - value is 2 to denote to the sorter its relative position of importance in the field ACTION-CODE.
- CHANGE-CODE - value is 3 to denote to the sorter its relative position of importance in the field ACTION-CODE.
- DELETE-CODE - value is 1 to denote to the sorter its relative position of importance in the field ACTION-CODE.

7.1.3 ROUTINES

The following are internal subroutines of the Transaction Sorter program.

- IN-MAIN-LOOP - is performed until end of file is detected on the input transaction file to build each sort key and release each record to the SORT function.

- IN-READ-ROUTINE - reads a record of the input transaction file. At end-of-file, a switch is set to indicate an end-of-file condition.

- OUT-MAIN-LOOP - is performed until end of file on the sorted transaction file is detected to return each sorted record and write it to the output transaction file.

7.1.4 DIAGNOSTIC MESSAGES

The following diagnostic messages may be generated by the Transaction Sorter.

Message: Invalid action code - (not A,C or D) - transaction rejected.
Action: Correct error and resubmit transaction.

Message: Invalid segment ID - (not 0,1,2 or 3) - transaction rejected.
Action: Correct error and resubmit transaction.

7.2 MASTER FILE SORT

The EIS/P&R Master File sort function is performed by two separate programs, the Master File Sorter Generator and the Master File Sorter.

The functions of the Master File Sorter Generator/Master File Sorter are:

a. Editing and processing of sort and control statements.

b. Compilation of the Master File Sorter to produce a COBOL program for actual sorting.

c. Execution of the COBOL program and construction of the answer data set containing the sorted records.

7.2.1 MASTER FILE SORTER GENERATOR

The Master File Sorter Generator reads a set of control and sort cards, edits the cards, and if no major errors are found, generates a COBOL program which, when executed, will perform the specified sort functions.

The working storage section of the Master File Sorter Generator contains several sets of COBOL skeleton statements. These statements, when completed, will be inserted into a skeleton Master File Sorter program which is also input to the Master File Sorter Generator to be completed. The input sort transactions are read, edited, and saved in WORKING-STORAGE for use in generating the Master File Sorter program. Then, if no major error was encountered, the skeleton program is read sequentially; and the proper statements are inserted into the skeleton program as the program is being written as an output file. If a major error is encountered, no program is output.

The CDHS Master File Sorter Generator program requires $$ control statements and sort statements. The statements must be specified in the following sequence:

```
$$SORT
   sort statements
$$END
```

SORT Control Card

The sort control card indicates the beginning of the sort requests. The card is optional and contains one fixed format as follows:

Cols 1 - 6 $$SORT

If this card is missing, it will be assumed, and an diagnostic message will be printed (see subsection 7.2.1.4). Immediately following the sort control cards are from one to eleven sort specification statements. The sequence of these cards determine the order of the sort key. The first field following the $$SORT will be the most important part of the key, with each field following of lesser importance. Each sort statement consists of two fixed format fields, as follows:

Cols 1 - 40	sort name
Col 41	sort order

The sort name field contains the name of a data file field which is to be sorted. The total length of all these fields in the Master File considered as a group must be less than 234 characters.

The sort order field describes the order of sorting the specified field. This field must contain the letter A for ascending or D for descending depending on the desired sort order.

END Control Card

The END Control Card indicates the end of statements for the sort. This card is optional and contains $$END in card columns 1-5. If this card is missing, it will be assumed, and a diagnostic message will be printed (see subsection 7.2.1.4).

The following list of names from the fixed segment (PLANT) may be referenced referenced in the sort statements:

AQCR
CITY
CONTACT
COUNTY
DATE-OF-O-RECORD
ESTABLISHMENT
LOCAL-CONTROL
MAILING-ADDRESS
NUMBER-OF-EMPLOYEES
OWNER
PLANT-ID
PRINCIPLE-PRODUCT
PROPERTY-AREA
RECORD-O-YEAR
RECORD-O-DAY
SEG-O-ID
SEG-O-SET-ID
SEGMENT-O-ID
STATE
TELEPHONE
USER-CONTROL-REGION
USER-PLANT-ID
UTM-ZONE

VALID SORT REQUESTS

TABLE 7.2

The following list of names from the point source segment may be referenced in the sort statements:

ALLOWABLE
ANNUAL-THRUPUT
BOILER-DESIGN-CAPACITY
CNTL-EQUIP-COST
COMPLIANCE-SCHEDULE
COMPLIANCE-STATUS
COMPLIANCE-STATUS-UPDATE
CONTROL-EQUIPMENT
CONTROL-REGULATIONS
DATE-OF-1-RECORD
DAY-WEEK
DEC-FEB
DIAMETER
ECAP
EMISSION-UNITS
EMISSIONS
EST-CONTROL-EFF
ESTIMATES
ESTIMATION-METHOD
FLOW-RATE
HEIGHT
HORIZONTAL
HOURS-DAY
IPP
JUN-AUG
LATITUDE
LATITUDE-DEGREE
LATITUDE-MINUTE
LATITUDE-SECOND
LONGITUDE
LONGITUDE-DEGREE
LONGITUDE-MINUTE
LONGITUDE-SECOND
MAR-MAY
MEASURED
NBR-OF-POLLUTANTS
NEDS-POINT-ID
NORMAL-OPERATING
PLUME
POINT-ID
POINTS-PER-STACK
POLLUTANT-ID
PRIMARY-CNTL
RECORD-1-YEAR
RECORD-1-DAY
REG-1
REG-2
REG-3
SCHEDULE-MONTH
SCHEDULE-YEAR
SECONDARY-CNTL
SEG-1-ID
SEG-1-SET-ID
SEGMENT-1-ID
SEP-NOV
SIC
SPACE-HEAT
STACK-DATA
STATUS-DAY
STATUS-MONTH
STATUS-YEAR
TEMPERATURE
TEST-METHOD
USER-POINT-ID
UTM-COORDINATES
VERTICAL
VELOCITY
WEEK-YEAR

VALID SORT REQUESTS
TABLE 7.2 (continued)

The following list of names from the machine process segment may be referenced in the sort statements:

ASH-CONTENT
BEC
BEC-ID
BEC-NUMBER
CONFIDENTIALITY
DATE-OF-2-RECORD
EMISSION-FACTOR-source
FUEL-PROCESS-RATE
FUEL-UNITS
HEAT-CONTENT
MAX-DESIGN-RATE
NUMBER-OF-EF
RECORD-2-YEAR
RECORD-2-DAY
SCC
SCC-I
SCC-II
SCC-III
SCC-IV
SEG-2-ID
SEG-2-SET-1-ID
SEG-2-SET-2-ID
SEGMENT-2-ID
SOURCE CODE
SOURCE DESCRIPTION
SULFUR-CONTENT

VALID SORT REQUESTS
TABLE 7.2 (continued)

7.2.1.1 ORGANIZATION

The following are the main modules of the Master File Sorter Generator program:

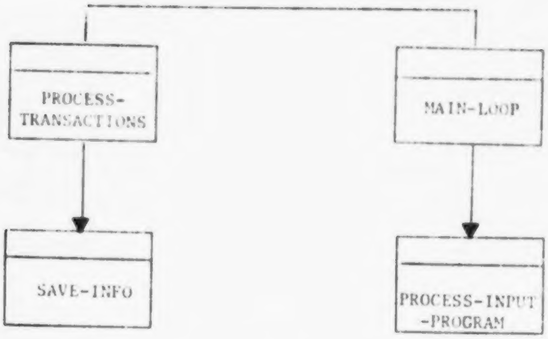
- PROCESS-TRANSACTIONS - is performed by ROOT-SEGMENT to control the reading and editing of the input transaction file. PROCESS-TRANSACTIONS will output an error message for each error encountered in the control cards and the sort statements and set a flag for any major error occurring to indicate that a Master File Sorter program should not be generated. It invokes SAVE-INFO to save in WORKING-STORAGE the transaction for later use.

- MAIN-LOOP - is performed by ROOT-SEGMENT until the end of the file is encountered on the input skeleton program or until the major error flag is set. MAIN-LOOP controls the generation of the Master File Sorter program. It invokes PROCESS-INPUT-PROGRAM to generate the appropriate COBOL statements and insert them into the Master File Sorter program skeleton.

- PROCESS-INPUT-PROGRAM - is performed by MAIN-LOOP to process the Master File Sorter Generator skeleton. The input program file is read and written out to the output program file until insertion location is found. When the insertion location is found, the corresponding paragraph is performed to complete the appropriate skeleton sentences in WORKING-STORAGE and insert them into the proper place in the output program file.

- SAVE-INFO - is performed by PROCESS-TRANSACTIONS to process each sort statement. Each sort statement is checked for an A or D in card column 41 and the data name is checked for validity. If the name is valid, the transaction is saved in WORKING-STORAGE for later use in generating the output program.

Figure 7.2.1.1 illustrates the organization of JXSRTGEN.


PROCESS-TRANSACTIONS
MAIN-LOOP
SAVE-INFO
PROCESS-INPUT-PROGRAM

GXSRTGEN Organization
Figure 7.2.1.1

7.2.1.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the Master File Sorter Generator program:

- DATA-NAME-FOUND-SW - is set to true when the data name is found when searching the valid names table.

- END-OF-FILE-SW - is set to true when the end-of-file condition is found on the input transaction file or the input program file.

- ERR-FOUND-SW - is set to true when an error is found significant enough to cause problems to the new program being generated. The errors which could cause this to be set are: no control cards, invalid data name, no valid sort requests, more than 11 sort statements, invalid sort sequence, or more than 233 characters in the fields of file data names. (see subsection 7.2.1.2)

- REPEATING-1-SW - is set to true if a sort field is from the repeating portion of the point source record.

- SORT-SENTENCES - is a set of skeleton sentences to be completed by the Master File Sorter Generator program to be inserted into the output program.

- VALID-NAMES-TABLES - contains all valid field names for the sort statements.

7.2.1.3 ROUTINES

The following are internal subroutines of the Master File Sorter Generator program:

- MOVE-STOP1-INFO builds parts of the sort definitions and inserts them into the output program file.
- MOVE-STOP2-3-4-INFO builds parts of the sort definitions and inserts them into the output program file.
- MOVE-STOP5-INFO builds parts of the procedure division and inserts them into the output program file.
- MOVE-STOP6-INFO builds parts of the procedure division and inserts them into the output program file.
- MOVE-STOP7-INFO builds parts of the procedure division and inserts them into the output program file.
- READ-CONTROL-CARDS reads the control card file and sets END-OF-FILE-SW when an end-of-file condition is encountered.
- READ-INPUT-PROGRAM reads each record of input program file and if the record is not an insertion indicator record, it is written to the output program file.
- SEARCH-TABLE scans the VALID-NAMES-TABLE in WORKING-STORAGE for a match of name from the input transaction and the table. If a match is found, the DATA-NAME-FOUND-SW is set to true.

7.2.1.4 DIAGNOSTIC MESSAGES

The following diagnostic messages may be generated by the Master File Sorter Generator.

Message: Premature end of file on control card file - assuming $$END card.
Meaning: $$END card is missing. System assumes it is present and continues processing.
Action: No action necessary.

Message: First control card not $$SORT - assumed present.
Meaning: $$SORT card is missing. System assumes it is present and continues processing.
Action: No action necessary.

Message: Data name invalid - run aborted.
Meaning: Either an invalid data name is used or a valid data name is misspelled.
Action: Correct error and resubmit transaction.

Message: Only $$END card found in input stream - run aborted.
Meaning: No sort request statements included, or they come after $$END card.
Action: Correct error and resubmit transaction.

Message: No valid sort requests - run aborted.
Meaning: An error exists in sort request cards.
Action: Correct error and resubmit transaction.

Message: ***Unexpected end of file on input program - run aborted.
Meaning: An error exists on the input skeleton COBOL Sort program.
Action: Obtain programming support from computer center.

Message: More than 233 characters in data name total character count - run aborted.
Meaning: A maximum of 233 characters is permitted in data name total character count.
Action: Correct error and resubmit transaction.

Message: More than 11 sort request cards - run aborted.
Meaning: A maximum of 11 sort request cards are permitted.
Action: Correct error and resubmit transaction.

Message: Requested sort sequence not valid - run aborted.
Meaning: Only 'A' for ascending, or 'D' for descending sort sequences are allowed. Any other character in this field is valid.
Action: Correct error and resubmit transaction.

Message: No control cards in input stream - run aborted.
Meaning: Neither control nor sort request cards are present.
Action: Correct error and resubmit transaction.

7.2.2 MASTER FILE SORTER

The Master File Sorter program produces an Answer File sorted as specified in the input to the Master File Sorter Generator program. This Answer File can be used as input to the Retriever, the Summary Report, and the File List programs. The contents of the Answer File varies depending on what files are being used for the sort.

For sort purposes, a logical record consists of the fixed segment (type 0 record), point source segments (type 1 record), machine process segments (type 2 record), and permits and registration segments (type 3 record). The machine process fields in the repeating portion of the machine process (type 2) record and all fields of the permits and registration records cannot be used for sort fields. All type 3 records are ignored by the Master File Sorter and do not ever appear in the Answer File produced by the Master File Sorter.

The Answer Files generated by the sort program will differ, depending on which type record the sort fields are in. Although the Answer File generated by the sort program will be in Master File format, the content of the Answer File will differ depending on the record type in which the sort fields reside. The following will illustrate these differences.

a) SORT fields from the fixed segment (record type 0).
A logical record will be generated for each sorted type 0 record. Each type 0 record will be accompanied by its associated type 1 and type 2 records. No new records are created.

b) Sort fields from the fixed portion of the point source segment (record type 1).
A logical record will be generated for each sorted type 1 record. Each type 1 record will be accompanied by its

associated type 2 records and for each type 1 record, the proper type 0 record will be created. The new records created are the type 0 records, since each type 1 record now physically carries its own type 0 record (as opposed to the Master File in which a type one record along with other type one records are under a 0 record).

c) Sort fields from the repeating portion of the point source segment (record type 1).

A logical record will consist of a new sorted type 1 record for each repetition in the type 1 record. Each of these newly created type 1 records will have the original type 1's type 2 records and type 0 record created also. The new records created are type 1 records because each repetition now becomes its own individual type 1 record and type 0 and 2 records because the new type 1 record must physically include its type 0 and 2 records with each new type 1 record created from a type 1 repetition.

d) Sort fields are from the fixed portion of the machine process segment (record type 2).

A logical record will be generated for each sorted type 2 record. For each type 2 record, the proper type 0 and type 1 record will be created. The new records created are the type 0 and type 1 records, since each type 2 record now carries its own type 0 and type 1 records.

e) Sort fields are from the repeating portion of the point source segment (record type 1) and the fixed portion of the machine process (record type 2).

A logical record will consist of one newly sorted type 1 repetition record (created as its own complete physical type 1 record), one sorted type 2 record (broken from the other type 2 records) and the corresponding type 0 record. For example, from one logical record in the Master File consisting of a type 0 record, a type 1 record with three repetitions, and two type 2 records, the sort program will generate these six logical records:

[(type 0, type 1 (repeat 1), type 2 (1)),
(type 0, type 1 (repeat 2), type 2 (1)),
(type 0, type 1 (repeat 3), type 2 (1)),
(type 0, type 1 (repeat 1), type 2 (2)),
(type 0, type 1 (repeat 2), type 2 (2)),
(type 0, type 1 (repeat 3), type 2 (2))]*

*These 6 logical records will be in a sort order determined by the sort statements input to the Master File Sorter Generator Program.

The sort order of all these logical records (as explained in a through e) in the Answer File will be dependent on the control cards input to the Master File Sorter Generator program. The sort order will be determined by the sequence of these cards. The first will be the high subfield of the sort key (most significant), the next will be the next lower subfield, ...and the last will be the lowest (least significant).

7.2.2.1 ORGANIZATION

The following are the main modules of the Master File Sorter program:

- INPUT-PROCEDURE - is the input section for the SORT statement.

- IN-ROOT-SEGMENT - is the paragraph which controls the reading of each record into core storage and performs IN-MAIN-LOOP to build each record key and sort record to be released to the SORT function.

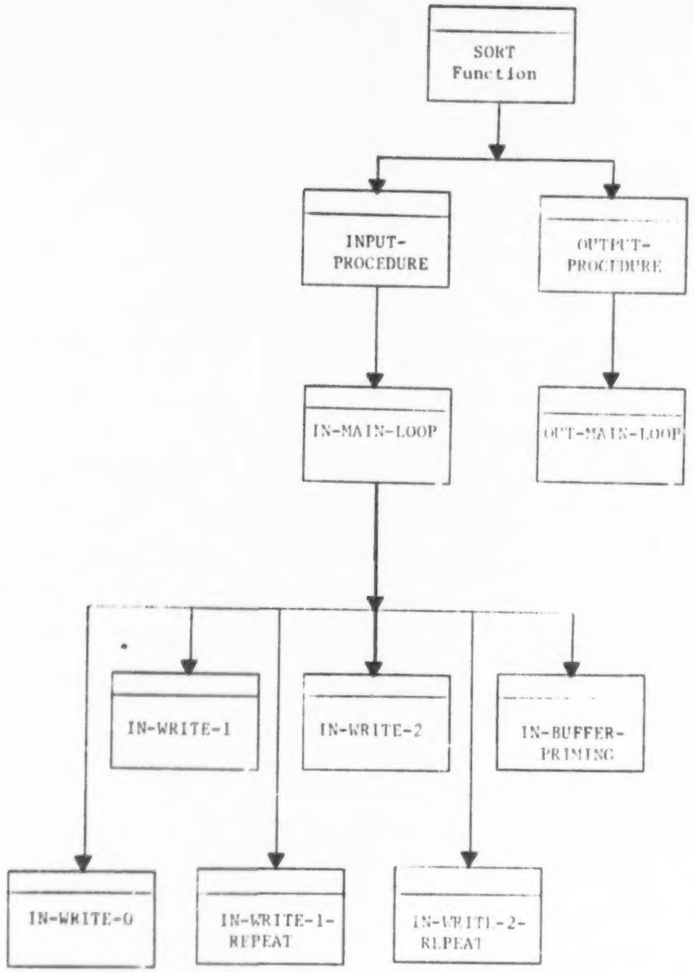
- IN-MAIN-LOOP - is performed by IN-ROOT-SEGMENT until an end of file is detected on the input Master File. IN-MAIN-LOOP performs IN-BUFFER-PRIMING to read and store in core a Master File logical record for further dissection into the new sort logical records and IN-WRITE-2, IN-WRITE-2-REPEAT, IN-WRITE-1-REPEAT, IN-WRITE-1, or IN-WRITE-0 to build each appropriate logical sort record with sort key, which has been created from the Master File logical record and to release each record to the sort function.

- IN-BUFFER-PRIMING - is performed by IN-MAIN-LOOP until a master file logical record (1 type 0, 1 type 1, 1-6 type 2 records) has been brought into WORKING-STORAGE. This will be performed to allow the Master File logical record to stay in WORKING-STORAGE until it has been properly dissected into all its new sorted logical records.

- IN-WRITE-0, IN-WRITE-1, IN-WRITE-1-REPEAT, IN-WRITE-2, IN-WRITE-2-REPEAT -- one of these is performed for each logical Master File record brought into working storage. Each appropriately dissects a Master File logical record into newly sorted logical records built with an appropriate sort key. Each then is released to the sort function. Choice of which paragraph to perform is made on certain basic factors (which types of records are in the Master File logical record and which type records the fields for sort are in).

- OUTPUT-PROCEDURE - is the output section for the SORT statement.
- OUT-ROOT-SEGMENT - is the paragraph which controls the return of the now sorted records and performs OUT-MAIN-LOOP to write on the Answer File each new physical record.
- OUT-MAIN-LOOP - is performed by OUT-ROOT-SEGMENT until end of file is detected on the sorted file to strip the key from the sorted record and write it on the Answer File.

Figure 7.2.2.1 illustrates the organization of the Master File Sorter.


SORT
Function
INPUT-
PROCEDURE
OUTPUT-
PROCEDURE
IN-MAIN-LOOP
OUT-MAIN-LOOP
IN-WRITE-1
IN-WRITE-2
IN-BUFFER-
PRIMING
IN-WRITE-0
IN-WRITE-1-
REPEAT
IN-WRITE-2-
REPEAT

MASTER FILE SORTER Organization
Figure 7.2.2.1

7.2.2.2 COMMUNICATION AND DATA FORMATS

The following COBOL WORKING-STORAGE section fields are the major control and data areas internal to the Master File Sorter program.

- END-OF-FILE-SW - is set to true when the end of file condition is detected on the Input Master File during the input procedure or on the Sorted File during the output procedure.

- RECORD-IN-CORE - is set to indicate which type of record is the last record of a Master File logical record. This is set by IN-BUFFER-PRIMING.

- REPEAT-1-SORT-SW - is set to true when a requested sort field is in the repeating portion of the type 1 record.

- SORT-REQUIRED - is set to the highest numeric segment of the sorts requested.

- MSTR-REC-0 - type 0 record of the logical Master File record in working storage.

- MSTR-REC-1 - type 1 record of the logical Master File record in working storage.

- MSTR-REC-2 - is the type 2 record of the logical Master File record in working storage being worked on at present.

- SAVE-ALL-SET2 - is the type 2 records of the logical Master File record in working storage.

7.2.2.3 ROUTINES

The following are internal subroutines of the Master File Sorter program.

- IN-BUILD-SORT-KEY - is performed to build the appropriate information into the sort key of each sort record being released to the sort function.
- IN-READ-ROUTINE - is performed to read each Input Master File record and set the end-of-file-SW to true on detection of an end of file condition.
- IN-SEGMENT-2 - is performed to bring all set 2 records for a Master File logical record into core.

7.2.2.4 DIAGNOSTIC MESSAGES

The following diagnostic messages may be generated by the Master File Sorter.

Message: Master File contains no records.
Meaning: The Master File input to the sorter is not good or is a null file.
Action: Input a valid Master File.

Message: Sorted file contains no records.
Meaning: The Master File was not good or null, therby producing a null sorted file.

Message: Unknown record type found - record ignored.
Meaning: A record type other than 0,1,2,3 was found.
Action: Check for error on Master File as indicated by accompanying message and correct.

Message: Key = xxxxxxxxxxxxx, DATE = xxxxx, Seg-ID = xxx.
Meaning: This message, in conjunction with the above message will give information to identify bad record.
Action: Use information to locate record.

Appendix A - Cataloged Procedures

Page

PNRANCNV: NEDS Area Source Output 277

PNRBREPT: Summary Report 282

PNRCNVRT: NEDS Point Source to EIS/P&R 289

PNRDCONV: NEDS Area Source to EIS/P&R 294

PNREFUPD: Emission Factors Transaction Generator 299

PNRFUPDT: EIS/P&R File Maintenance 306

PNRHREPT: NEDS Area Source Report 312

PNRISORT: EIS/P&R Transaction Sort 317

PNRKEFIN: Emission Factors Insert 322

PNRNCONV: NEDS Point Source File Output 327

PNRPREPT: EIS/P&R File List Output 332

PNRRETVR: Retrieval 337

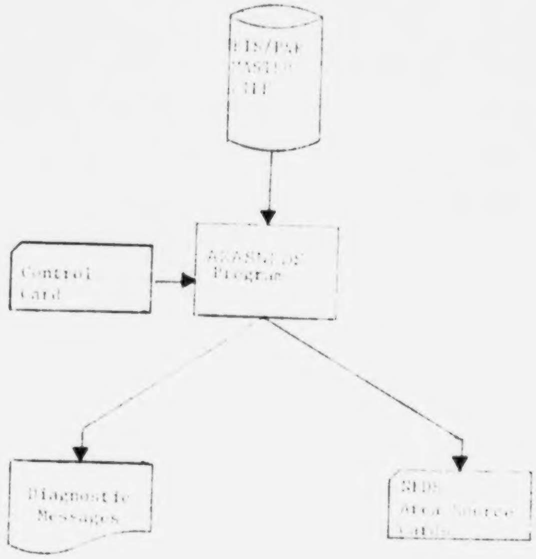
PNRSORTR: EIS/P&R Master File Sort 347

PNRTBGEN: Emission Factors Table Generator 356

Use of Cataloged Procedures 362

PNRANCNV - NEDS AREA SOURCE OUTPUT

PNRANCNV is executed to output NEDS area source data from EIS/P&R File records. There are two input files used by the program. The first, defined by PNRINPUT, contains the control card to indicate whether the transactions generated will be A, C, or D. The second, defined by PNRMASTR, contains the EIS/P&R File (either Master or Answer). There are two output files used by the program. The first, defined by PNRNEDS, contains the NEDS area source records produced by the program. The second, defined by PNRPRINT, contains diagnostic messages generated during the output process.


EIS/PAF
MASTER
FILE
Control
Card
Program
Diagnostic
Messages
Area Source
Cards

PNRANCNV - Data Flow
Figure A-1

DDNAME	Description
PNRINPUT	Control Card
PNRMASTR	EIS/P&R Master File to be converted
PNRNEDS	Data set to contain NEDS records
PNRPRINT	Print file for diagnostic messages.

PNRANCNV - DDNAMES

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	AXASNEDS	Program to convert EIS/P&R Area Source File to NEDS records
MSTRFIL	FTMSTRAA	Lowest level index of EIS/P&R File to be converted
NEDSOUT	B	SYSOUT class of punched NEDS records
OUT	A	SYSOUT class of all print files.

PNRANCNV - Substitutable Parameters

PNRANCNV

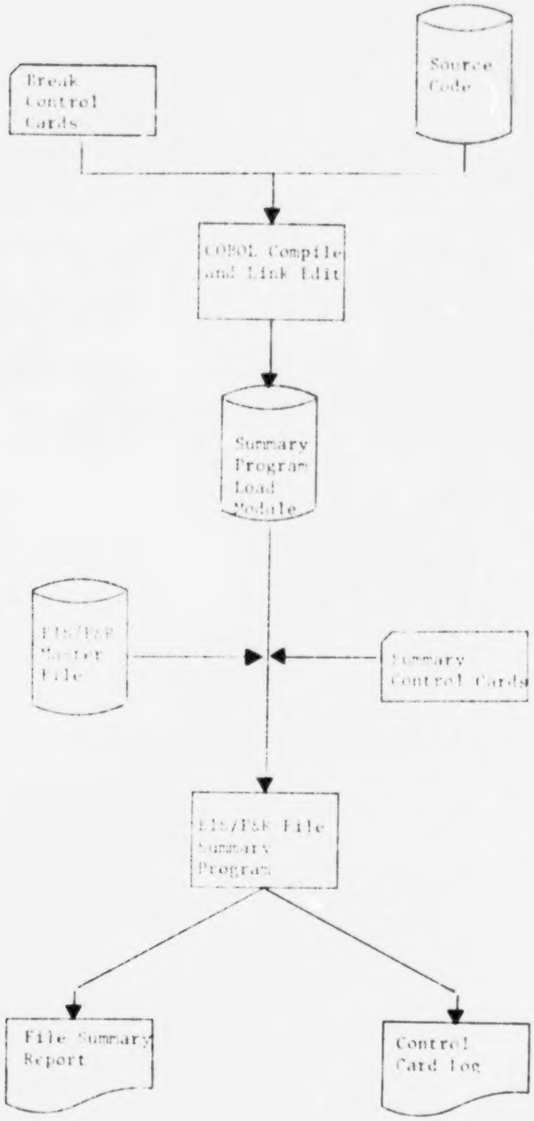
```
//*            PNRANCNV                   HURLEY RF        WF4   01/31/75
//*
//PNRANCNV PROC PROJECT='SYS2.PNR',
//             PROGRAM=AXASNEDS,
//             MSTRFIL=FTMSTRAA,
//             NEDSOUT=B,
//             OUT=A
//*
//CONVERT EXEC PGM=&PROGRAM,
//             REGION=24K,
//             TIME=(1,0)
//*
//* CONVERT EIS/P&R AREA SOURCE FILE TO NEDS FORMAT
//*
//STEPLIB   DD DSNAME=&PROJECT..LOAD,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* INPUT DATA SET - CONTROL CARD
//*
//PNRINPUT  DD DDNAME=INPUT,
//             DCB=BLKSIZE=80
//*
//* INPUT DATA SET - EIS/P&R MASTER FILE
//*
//PNRMASTR  DD DSNAME=&PROJECT..DATA.&MSTRFIL,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* OUTPUT DATA SET - NEDS FILE
//*
//PNRNEDS   DD SYSOUT=&NEDSOUT
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//PNRPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SETS - SYSTEM OPERATION
//*
//SYSPRINT  DD SYSOUT=&OUT
//*
//SYSOUT    DD SYSOUT=&OUT
//*
//SYSCBOUT  DD SYSOUT=&OUT
//*
//SYSDTERM  DD SYSOUT=&OUT
//*
//SYSUDUMP  DD SYSOUT=&OUT
//*
```

PNRBREPT - SUMMARY REPORT

PNRBREPT is executed to produce a summary report of an EIS/P&R File (either Master or Answer). The procedure consists of three separate steps.

The first step, the COBOL compiler, compiles the skeleton Summary program with user-supplied control cards. The input to the COBOL compiler consists of COBOL statements controlling the breaks in the report to be produced. The output from the COBOL compiler consists of an object module which is passed to the second step, the linkage editor. The linkage editor combines the summary program object code with COBOL subroutines and produces an executable load module of the Summary Report program.

The third step, the Summary Report program, generates the summary EIS/P&R File. There are two input files used by the Summary program. The first, defined by PNRINPUT, contains the control cards for the titling of the report. The second, defined by PNRMASTR, contains the EIS/P&R File to be summarized. There are two output files used by the Summary program. The first, defined by PNRPRINT, contains the control card log. The second, defined by PNREPORT, contains the summary report of the EIS/P&R File.


Break Control Cards
Source Code
COBOL Compile and Link Edit
Summary Program Load Module
EIS/F&R Master File
Summary Control Cards
EIS/F&R File Summary Program
File Summary Report
Control Card Log

PNRBREPT - Data Flow
Figure A-2

DDNAME	Description
PNRINPUT	Control cards for summary report
PNRMASTR	EIS/P&R File to be summarized
PNRPRINT	Print file for control card log
PNREPORT	Print file for summary report.

PNRBREPT - DDNAMES

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PARAM	'SIZE=94K, BUF=10K, NOSEQ, SUPMAP, NOSOURCE'	COBOL parameters for compile
TEMP	SYSDA	Unit type to be used for temporary work space
MSTRFIL	FTMSTRAA	Lowest level index of EIS/P&R File to be summarized
MEMBER	BDSUMARY	Name of first member of summary program
M2	BDFILSEC	Name of second member
M3	BDWORK77	Name of third member
M4	BDWORK01	Name of fourth member
M5	BDRPTSEC	Name of fifth member
M6	BPSUMARY	Name of sixth member
OUT	A	SYSOUT class for all print files.

PNRBREPT - Substitutable Parameters

```
//*             PNRBREPT                 HURLEY RF         WF4   01/31/75 00000100
//*                                                                     00000200
//PNRBREPT PROC PROJECT='SYS2.PNR',                                     00000300
//              PARAM='SIZE=94K,BUF=10K,NOSEQ,SUPMAP,NOSOURCE',         00000400
//              TEMP=SYSDA,                                             00000500
//              MSTRFIL=FTMSTRAA,                                       00000600
//              MEMBER=BDSUMARY,                                        00000700
//              M2=BDFILSEC,                                            00000800
//              M3=BDWORK77,                                            00000900
//              M4=BDWORK01,                                            00001000
//              M5=BDRPTSEC,                                            00001100
//              M6=BPSUMARY,                                            00001200
//              OUT=A                                                   00001300
//*                                                                     00001400
//COMPILE EXEC PGM=IKFCBL00,                                            00001500
//              PARM='&PARAM',                                          00001600
//              REGION=100K,                                            00001700
//              TIME=(2,0)                                              00001800
//*                                                                     00001900
//* COMPILE EIS/PER SUMMARY PROGRAM                                     00002000
//*                                                                     00002100
//*                                                                     00002200
//* INPUT DATA SET - SOURCE LIBRARY                                     00002300
//*                                                                     00002400
//SYSLIB    DD DSNAME=&PROJECT..SOURCE,                                 00002500
//             VOLUME=(PRIVATE,RETAIN),                                 00002600
//             DISP=(SHR,PASS)                                          00002700
//*                                                                     00002800
//* INPUT DATA SET - COBOL SUMMARY PROGRAM SOURCE CODE                  00002900
//*                                                                     00003000
//SYSIN     DD DSNAME=&PROJECT..SOURCE(&MEMBER),                        00003100
//             VOLUME=(PRIVATE,RETAIN),                                 00003200
//             DISP=(SHR,PASS)                                          00003300
//*                                                                     00003400
//          DD DSNAME=&PROJECT..SOURCE(&M2),                            00003500
//             VOLUME=(PRIVATE,RETAIN),                                 00003600
//             DISP=(SHR,PASS)                                          00003700
//*                                                                     00003800
//          DD DSNAME=&PROJECT..SOURCE(&M3),                            00003900
//             VOLUME=(PRIVATE,RETAIN),                                 00004000
//             DISP=(SHR,PASS)                                          00004100
//*                                                                     00004200
//          DD DSNAME=&PROJECT..SOURCE(&M4),                            00004300
//             VOLUME=(PRIVATE,RETAIN),                                 00004400
//             DISP=(SHR,PASS)                                          00004500
//*                                                                     00004600
//          DD DSNAME=&PROJECT..SOURCE(&M5),                            00004700
//             VOLUME=(PRIVATE,RETAIN),                                 00004800
//             DISP=(SHR,PASS)                                          00004900
//*                                                                     00005000
//          DD DSNAME=&PROJECT..SOURCE(&M6),                            00005100
//             VOLUME=(PRIVATE,RETAIN),                                 00005200
//             DISP=(SHR,PASS)                                          00005300
//*                                                                     00005400
//          DD DDNAME=INPUT,                                            00005500
//             DCB=BLKSIZE=80                                           00005600
//*                                                                     00005700
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                               00005800
```

Reproduced from best available copy.

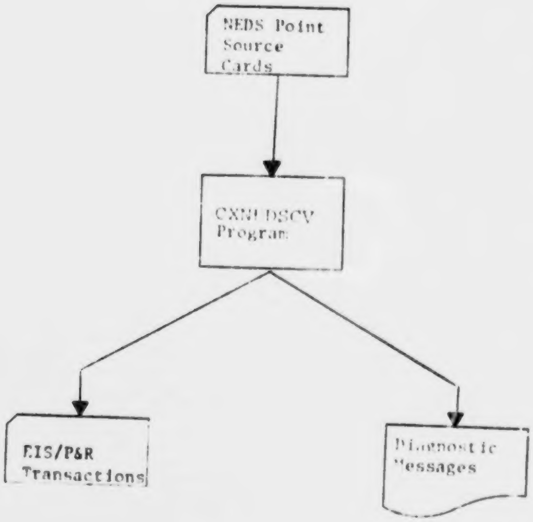
```
//*                                                                     00005900
//SYSPRINT  DD SYSOUT=&OUT                                              00006000
//*                                                                     00006100
//* OUTPUT DATA SET - COBOL SUMMARY PROGRAM OBJECT CODE                 00006200
//*                                                                     00006300
//SYSLIN    DD UNIT=&TEMP,                                              00006400
//             DISP=(NEW,PASS),                                         00006500
//             SPACE=(TRK,(5,2),RLSE),                                  00006600
//             DSNAME=&&OBJMOD                                          00006700
//*                                                                     00006800
//* UTILITY DATA SETS                                                   00006900
//*                                                                     00007000
//SYSUT1    DD UNIT=&TEMP,                                              00007100
//             SPACE=(TRK,(50,100))                                     00007200
//*                                                                     00007300
//SYSUT2    DD UNIT=(&TEMP,SEP=SYSUT1),                                 00007400
//             SPACE=(TRK,(50,100))                                     00007500
//*                                                                     00007600
//SYSUT3    DD UNIT=(&TEMP,SEP=(SYSUT1,SYSUT2)),                        00007700
//             SPACE=(TRK,(50,100))                                     00007800
//*                                                                     00007900
//SYSUT4    DD UNIT=(&TEMP,SEP=(SYSUT1,SYSUT2,SYSUT3)),                 00008000
//             SPACE=(TRK,(50,100))                                     00008100
//*                                                                     00008200
//LKED    EXEC PGM=IEWL,                                                00008300
//             PARM='LIST,LET,XREF',                                    00008400
//             REGION=100K,                                             00008500
//             TIME=(1,0)                                               00008600
//*                                                                     00008700
//* LINK-EDIT SUMMARY PROGRAM                                           00008800
//*                                                                     00008900
//*                                                                     00009000
//* INPUT DATA SET - AUTO-CALL LIBRARY                                  00009100
//*                                                                     00009200
//SYSLIB    DD DSNAME=&PROJECT..LOAD,                                   00009300
//             VOLUME=(PRIVATE,RETAIN),                                 00009400
//             DISP=(SHR,PASS)                                          00009500
//          DD DSNAME=SYS1.COBLIB,                                      00009600
//             VOLUME=(PRIVATE,RETAIN),                                 00009700
//             DISP=(SHR,PASS)                                          00009800
//*                                                                     00009900
//* INPUT DATA SET - COBOL SUMMARY PROGRAM OBJECT CODE                  00010000
//*                                                                     00010100
//SYSLIN    DD DSNAME=&&OBJMOD,                                         00010200
//             DISP=(OLD,DELETE)                                        00010300
//          DD DDNAME=INPLT,                                            00010400
//             DCB=BLKSIZE=80                                           00010500
//*                                                                     00010600
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                               00010700
//*                                                                     00010800
//SYSPRINT  DD SYSOUT=&OUT                                              00010900
//*                                                                     00011000
//* OUTPUT DATA SET - COBOL SUMMARY PROGRAM LOAD MODULE                 00011100
//*                                                                     00011200
//SYSLMOD   DD UNIT=&TEMP,                                              00011300
//             DISP=(MOD,PASS),                                         00011400
//             SPACE=(TRK,(10,5,1)),                                    00011500
//             DSNAME=&&LOADMOD(SUMMARY)                                00011600
```

FNRBREPT

```
//*
//* UTILITY DATA SET                                                    00011700
//*                                                                     00011800
//SYSUT1    DD UNIT=&TEMP,                                              00011900
//             SPACE=(TRK,(10,5))                                       00012000
//*                                                                     00012100
//SUMMARY EXEC PGM=*.LKED.SYSLMOD,                                      00012200
//             REGION=30K,                                              00012300
//             TIME=(1,0)                                               00012400
//*                                                                     00012500
//* PRODUCE EIS/P&R SUMMARY REPORT                                      00012600
//*                                                                     00012700
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                   00012800
//             VOLUME=(PRIVATE,RETAIN),                                 00012900
//             DISP=(SHR,PASS)                                          00013000
//*                                                                     00013100
//* INPUT DATA SET - CONTROL CARDS                                      00013200
//*                                                                     00013300
//PNRINPUT  DD DDNAME=INPUT,                                            00013400
//             DCB=BLKSIZE=80                                           00013500
//*                                                                     00013600
//* INPUT DATA SET - EIS/P&R MASTER FILE                                00013700
//*                                                                     00013800
//PNRMASTR  DD DSNAME=&PROJECT..DATA.&MSTRFIL,                          00013900
//             VOLUME=(PRIVATE,RETAIN),                                 00014000
//             DISP=(SHR,PASS)                                          00014100
//*                                                                     00014200
//* OUTPUT DATA SET - CONTROL CARD LOG                                  00014300
//*                                                                     00014400
//PNRPRINT  DD SYSOUT=&OUT                                              00014500
//*                                                                     00014600
//* OUTPUT DATA SET - SUMMARY REPORT                                    00014700
//*                                                                     00014800
//PNREPORT  DD SYSOUT=&OUT                                              00014900
//*                                                                     00015000
//* OUTPUT DATA SETS - SYSTEM OPERATION                                 00015100
//*                                                                     00015200
//SYSPRINT  DD SYSOUT=&OUT                                              00015300
//*                                                                     00015400
//SYSOUT    DD SYSOUT=&OUT                                              00015500
//*                                                                     00015600
//SYSDBOUT  DD SYSOUT=&OUT                                              00015700
//*                                                                     00015800
//SYSDTERM  DD SYSOUT=&OUT                                              00015900
//*                                                                     00016000
//SYSUDUMP  DD SYSOUT=&OUT                                              00016100
//*                                                                     00016200
                                                                        00016300
```

PNRCNVRT - NEDS POINT SOURCE TO EIS/P&R

PNRCNVRT is executed to convert NEDS point source records to EIS/P&R transactions. The input to the conversion program consists of a NEDS point source file, (this file must be unblocked) defined by PNRNEDS. There are two output files used by the conversion program. The first, defined by PNRTRANS, contains the EIS/P&R file maintenance transactions produced by the conversion program. The second, defined by PNRPRINT, contains diagnostic messages generated during the conversion process.


NEDS Point Source Cards
CXNEDSCV Program
EIS/P&R Transactions
Diagnostic Messages

PNRCNVRT - Data Flow
Figure A-3

DDNAME	Description
PNRNEDS	Data set containing NEDS point source records
PNRTRANS	Data set to contain generated EIS/P&R transactions
PNRPRINT	Print file for diagnostic messages.

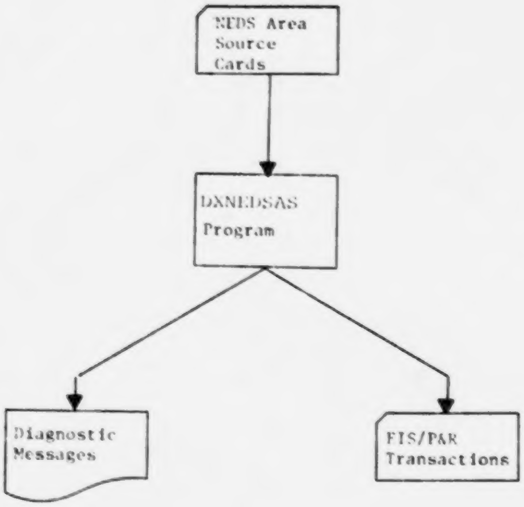
Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	CXNEDSCV	Program to convert NEDS point source records to EIS/P&R transactions
OUT	A	SYSOUT class of all print files.

PNRCNVRT - Substitutable Parameters

```
//*             PNRCNVRT                    HURLEY RF        WF4   01/31/75 00000100
//*                                                                       00000200
//PNRCNVRT PROC PROJECT='SYS2.PNR',                                       00000300
//              PROGRAM=CXNEDSCV,                                         00000400
//              OUT=A                                                     00000500
//*                                                                       00000600
//CONVERT EXEC PGM=&PROGRAM,                                              00000700
//              REGION=20K,                                               00000800
//              TIME=(1,0)                                                00000900
//*                                                                       00001000
//* CONVERT NEDS POINT SOURCE RECORDS TO EIS/P&R TRANSACTIONS             00001100
//*                                                                       00001200
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                     00001300
//              VOLUME=(PRIVATE,RETAIN),                                  00001400
//              DISP=(SHR,PASS)                                           00001500
//*                                                                       00001600
//* INPUT DATA SET - NEDS RECORDS                                         00001700
//*                                                                       00001800
//PNRNEDS   DD DDNAME=INPUT,                                              00001900
//              DCB=BLKSIZE=80                                            00002000
//*                                                                       00002100
//* OUTPUT DATA SET - EIS/P&R TRANSACTIONS                                00002200
//*                                                                       00002300
//PNRTRANS  DD DDNAME=OUTPUT                                              00002400
//*                                                                       00002500
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                                 00002600
//*                                                                       00002700
//PNRPRINT  DD SYSOUT=&OUT                                                00002800
//*                                                                       00002900
//* OUTPUT DATA SETS - SYSTEM OPERATION                                   00003000
//*                                                                       00003100
//SYSPRINT  DD SYSOUT=&OUT                                                00003200
//*                                                                       00003300
//SYSOUT    DD SYSOUT=&OUT                                                00003400
//*                                                                       00003500
//SYSDBOUT  DD SYSOUT=&OUT                                                00003600
//*                                                                       00003700
//SYSDTERM  DD SYSOUT=&OUT                                                00003800
//*                                                                       00003900
//SYSUDUMP  DD SYSOUT=&OUT                                                00004000
//*                                                                       00004100
```

PNRDCONV - NEDS AREA SOURCE TO EIS/P&R

PNRDCONV is executed to convert the NEDS area source records to EIS/P&R transactions. The input to the conversion program consists of a NEDS area source file, (the file must be unblocked) defined as PNRNEDS. There are two output files used by the conversion program. The first, defined by PNRTRANS, contains the EIS/P&R file maintenance transactions produced by the conversion program. The second, defined by PNRPRINT, contains the diagnostic messages generated during the conversion process.


NEDS Area Source Cards
DXNEDSAS Program
Diagnostic Messages
FIS/PAR Transactions

PNRDCONV - Data Flow
Figure A-4

DDNAME	Description
PNRNEDS	Data set containing NEDS area source records
PNRTRANS	Data set to contain generated EIS/P&R transactions
PNRPRINT	Print file for diagnostic messages.

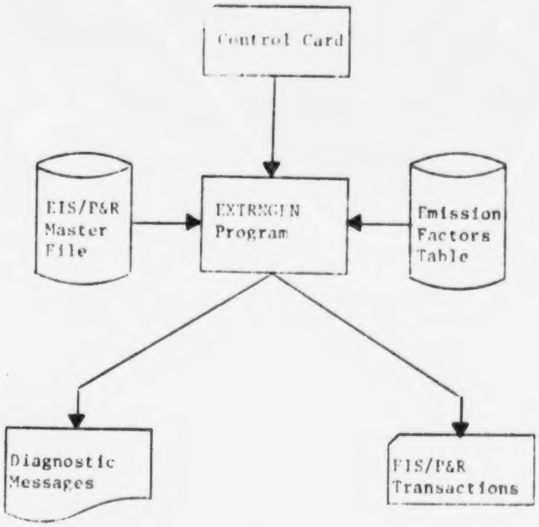
Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	DXNEDSAS	Program to convert NEDS area source records to EIS/P&R transactions
NEDSFIL	NEDS	Lowest level index of data set containing NEDS records
EISOUT	B	SYSOUT class of punched EIS/P&R transactions
OUT	A	SYSOUT class of all print files.

PNRDCONV - Substitutable Parameters

```
PNRCCCNV
//*            PNRDCONV                  HURLEY RF       WF4   01/31/75 00000100
//*                                                                     00000200
//PNRDCONV PRCC PROJECT='SYS2.PNR',                                     00000300
//             PROGRAM=DXNEDSAS,                                        00000400
//             NEDSFIL=NEDS,                                            00000500
//             EISPUT=B,                                                00000600
//             OUT=A                                                    00000700
//*                                                                     00000800
//CCNVERT EXEC PGM=&PROGRAM,                                            00000900
//             REGION=24K,                                              00001000
//             TIME=(1,0)                                               00001100
//*                                                                     00001200
//* CONVERT NEDS AREA SCURCE FILE TO EIS/P&R FORMAT                     00001300
//*                                                                     00001400
//STEPLIB   DD DSNAME=&PRCJECT..LOAD,                                   00001500
//             VOLUME=(PRIVATE,RETAIN),                                 00001600
//             DISP=(SHR,PASS)                                          00001700
//*                                                                     00001800
//* INPUT DATA SET - NEDS AREA SOURCE FILE                              00001900
//*                                                                     00002000
//PNRNEDS   DD DSNAME=&PRCJECT..DATA.&NEDSFIL,                          00002100
//             VOLUME=(PRIVATE,RETAIN),                                 00002200
//             DISP=(SHR,PASS)                                          00002300
//*                                                                     00002400
//* OUTPUT DATA SET - EIS/P&R TRANSACTIONS                              00002500
//*                                                                     00002600
//PNRTRANS  DC SYSOUT=&EISCUT                                           00002700
//*                                                                     00002800
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                               00002900
//*                                                                     00003000
//PNRPRINT  DD SYSOUT=&OUT                                              00003100
//*                                                                     00003200
//* OUTPUT DATA SETS - SYSTEM OPERATION                                 00003300
//*                                                                     00003400
//SYSPRINT  DD SYSOUT=&CUT                                              00003500
//*                                                                     00003600
//SYSOUT    DC SYSOUT=&CUT                                              00003700
//*                                                                     00003800
//SYSDBOUT  DD SYSOUT=&OUT                                              00003900
//*                                                                     00004000
//SYSDTERM  DD SYSOUT=&OUT                                              00004100
//*                                                                     00004200
//SYSUDUMP  DD SYSOUT=&CUT                                              00004300
//*                                                                     00004400
```

PNREFUPD - EMISSION FACTORS TRANSACTION GENERATOR

PNREFUPD is executed to update emission factors existing in the EIS/P&R Master File with new emission factors from the emission factors table. There are three input files used by the Emission Factors Transaction Generator program. The first, defined by PNRMASTR, contains the EIS/P&R file to be updated. The second, defined by PNREFTBL, contains the emission factors table. The third, defined by PNRINPUT, contains the control card which determines the emission factors to be updated. There are two output files used by the program. The first, defined by PNRTRANS, contains the EIS/P&R file maintenance transactions to update the emission factors in the Master File. The second, defined by PNRPRINT, contains diagnostic messages generated during the transaction generation process.


Control Card
EIS/P&R Master File
EXTRNGIN Program
Emission Factors Table
Diagnostic Messages
EIS/P&R Transactions

PNREFUPD - Data Flow
Figure A-5

DDNAME	Description
PNRINPUT	Control Card
PNRMASTR	EIS/P&R Master File to be updated
PNREFTBL	Emission factors table
PNRPRINT	Print file for diagnostic messages
PNRTRANS	Data set to contain generated EIS/P&R transactions.

PNREFUPD - DDNAMES

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	EXTRNGEN	Program to create EIS/P&R transactions to update emission factors
MSTRFIL	FTMSTRAA	Lowest level index of EIS/P&R Master File to be updated
EFTABLE	EFTABLE	Emission factors table
TRANS	TRANS	Lowest level index of data set to contain generated EIS/P&R transactions
UNIT	2314	Unit type on which the EIS/P&R transactions are to reside
SERIAL	RTCC02	Volume serial of volume upon which the EIS/P&R transactions are to reside
DISP	NEW,PASS, DELETE	Disposition of EIS/P&R transactions
SPCUNIT	TRK	Units in which space for EIS/P&R transactions are to be allocated
PRIMARY	5	Number of units to be allocated for EIS/P&R transactions' primary allocation

PNREFUPD - Substitutable Parameters

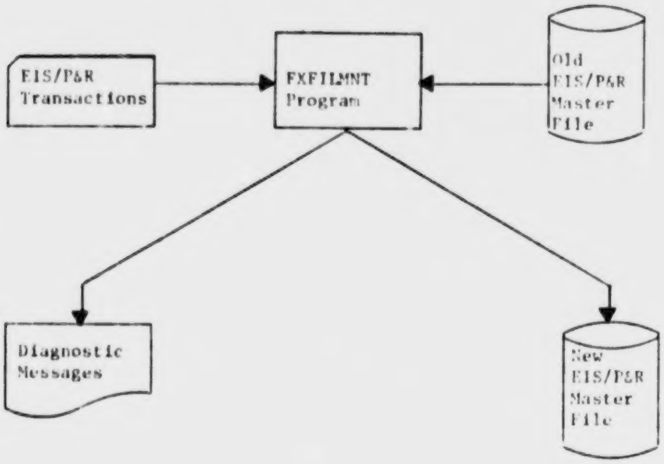
SECNDRY	1	Number of units to be allocated for EIS/P&R transactions' secondary allocation
OUT	A	SYSOUT class for all print files.

```
//*            PNREFUPD                  HURLEY RF        WF4    01/31/75 00000100
//*                                                                     00000200
//PNREFUPD PROC PROJECT='SYS2.PNR',                                     00000300
//             PROGRAM=EXTRNGEN,                                        00000400
//             MSTRFIL=FTMSTRAA,                                        00000500
//             EFTABLE=EFTABLE,                                         00000600
//             TRANS=TRANS,                                             00000700
//             UNIT=2314,                                               00000800
//             SERIAL=RTCCG2,                                           00000900
//             DISP='NEW,PASS,DELETE',                                  00001000
//             SPCUNIT=TRK,                                             00001100
//             PRIMARY=5,                                               00001200
//             SECNDRY=1,                                               00001300
//             OUT=A                                                    00001400
//*                                                                     00001500
//EFUPDATE EXEC PGM=&PROGRAM,                                           00001600
//             REGION=80K,                                              00001700
//             TIME=(1,0)                                               00001800
//*                                                                     00001900
//* PRODUCE EIS/PER TRANSACTIONS TO UPDATE EMISSION FACTORS             00002000
//*                                                                     00002100
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                   00002200
//             VOLUME=(PRIVATE,RETAIN),                                 00002300
//             DISP=(SHR,PASS)                                          00002400
//*                                                                     00002500
//* INPUT DATA SET - CONTROL CARD                                       00002600
//*                                                                     00002700
//PNRINPUT  DD DDNAME=INPLT,                                            00002800
//             DCB=BLKSIZE=80                                           00002900
//*                                                                     00003000
//* INPUT DATA SET - EIS/PER MASTER FILE                                00003100
//*                                                                     00003200
//PNRMASTR  DD DSNAME=&PROJECT..DATA.&MSTRFIL,                          00003300
//             VOLUME=(PRIVATE,RETAIN),                                 00003400
//             DISP=(SHR,PASS)                                          00003500
//*                                                                     00003600
//* INPUT DATA SET - EMISSION FACTORS TABLE                             00003700
//*                                                                     00003800
//PNREFTBL  DD DSNAME=&PROJECT..DATA.&EFTABLE,                          00003900
//             VOLUME=(PRIVATE,RETAIN),                                 00004000
//             DISP=(SHR,PASS)                                          00004100
//*                                                                     00004200
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                               00004300
//*                                                                     00004400
//PNRPRINT  DD SYSOUT=&OUT                                              00004500
//*                                                                     00004600
//* OUTPUT DATA SET - EIS/PER TRANSACTIONS                              00004700
//*                                                                     00004800
//PNRTRANS  DD UNIT=&UNIT,                                              00004900
//             VOLUME=(PRIVATE,RETAIN,SER=&SERIAL),                     00005000
//             DISP=(&DISP),                                            00005100
//             SPACE=(&SPCUNIT,(&PRIMARY,&SECNDRY),RLSE),               00005200
//             DSNAME=&PROJECT..DATA.&TRANS                             00005300
//*                                                                     00005400
//* OUTPUT DATA SETS - SYSTEM OPERATION                                 00005500
//*                                                                     00005600
//SYSPRINT  DD SYSOUT=&OUT                                              00005700
//*                                                                     00005800
```

```
FNREFUPD
          //SYSOUT     DD SYSOUT=&OUT                                00005900
          //*                                                        00006000
          //SYSDBOUT   DD SYSOUT=&OUT                                00006100
          //*                                                        00006200
          //SYSDTERM   DD SYSOUT=&OUT                                00006300
          //*                                                        00006400
          //SYSUDUMP   DD SYSOUT=&OUT                                00006500
          //*                                                        00006600
```

PNRFUPDT - EIS/P&R FILE MAINTENANCE

PNRFUPDT is executed to perform file maintenance functions on the EIS/P&R Master File. There are two input files used by the File Maintenance program. The first, defined by PNROLDMS, contains the EIS/P&R Master File to be updated (if any). The second, defined by PNRTRANS, contains the EIS/P&R file maintenance transactions. There are two output files used by the File Maintenance program. The first, defined by PNRMASTR, contains the updated or created EIS/P&R Master File. The second, defined by PNRPRINT, contains diagnostic messages generated during the file maintenance process and a listing of the input file maintenance transactions.


EIS/P&R Transactions
EXFILMNT Program
Old EIS/P&R Master File
Diagnostic Messages
New EIS/P&R Master File

PNRFUPDT - Data Flow
Figure A-6

DDNAME	Description
PNRTRANS	EIS/P&R transactions to update the Master File
PNROLDMS	EIS/P&R Master File to be updated
PNRMASTR	NEW EIS/P&R Master File
PNRPRINT	Print file for diagnostic messages.

PNRFUPDT - DDNAMES

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	FXFILMNT	EIS/P&R file maintenance program
OLDMASTR	FTMSTRAA	Lowest level index of EIS/P&R Master File to be updated
NEWMSTR	FTMSTRAB	Lowest level index of updated EIS/P&R Master File
UNIT	2314	Unit type upon which new file is to reside
SERIAL	RTCC02	Volume serial of volume upon which new file is to reside
DISP	NEW,CATLG, DELETE	Disposition of new file
SPCUNIT	TRK	Units in which space for the new file is to be allocated
PRIMARY	10	Number of units to be allocated for the new file's primary allocation
SECNDRY	5	Number of units to be allocated for the new file's secondary allocation
OUT	A	SYSOUT class of all print files.

PNRFUPDT - Substitutable Parameters

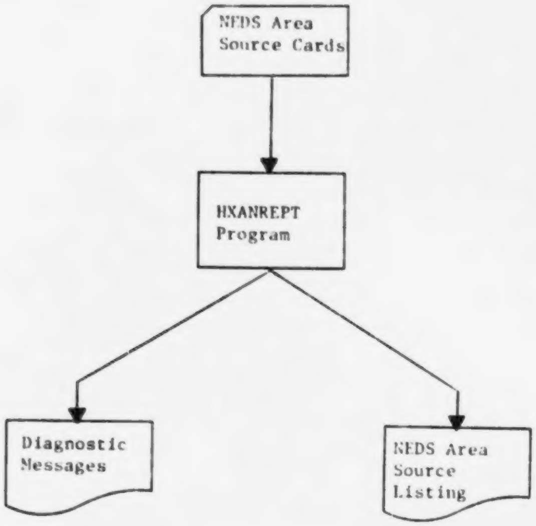
PNRFUPDT

```
//*              PNRFUPDT                    HURLEY RF         WF4   01/31/75 00000100
//*                                                                         00000200
//PNRFUPDT PROC PROJECT='SYS2.PNR',                                         00000300
//              PROGRAM=FXFILMNT,                                           00000400
//              OLDMSTR=FTMSTRAA,                                           00000500
//              NEWMSTR=FTMSTRAB,                                           00000600
//              UNIT=2314,                                                  00000700
//              SERIAL=RICCC2,                                              00000800
//              DISP='NEW,CATLG,DELETE',                                    00000900
//              SPCUNIT=TRK,                                                00001000
//              PRIMARY=10,                                                 00001100
//              SECNDRY=5,                                                  00001200
//              OUT=A                                                       00001300
//*                                                                         00001400
//UPDATE  EXEC PGM=&PROGRAM,                                                00001500
//              REGION=50K,                                                 00001600
//              TIME=(2,0)                                                  00001700
//*                                                                         00001800
//* MAINTAIN THE EIS/P&R MASTER FILE                                        00001900
//*                                                                         00002000
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                       00002100
//              VOLUME=(PRIVATE.RETAIN),                                    00002200
//              DISP=(SHR,PASS)                                             00002300
//*                                                                         00002400
//* INPUT DATA SET - TRANSACTION FILE                                       00002500
//*                                                                         00002600
//PNRTRANS  DD DDNAME=INPUT,                                                00002700
//              DCB=BLKSIZE=80                                              00002800
//*                                                                         00002900
//* INPUT DATA SET - OLD MASTER DATA BASE                                   00003000
//*                                                                         00003100
//PNROLDMS  DD DSNAME=&PROJECT..DATA.&OLDMSTR,                              00003200
//              VOLUME=(PRIVATE,RETAIN),                                    00003300
//              DISP=(SHR,PASS)                                             00003400
//*                                                                         00003500
//* OUTPUT DATA SET - NEW MASTER DATA BASE                                  00003600
//*                                                                         00003700
//PNRMASTR  DD UNIT=&UNIT,                                                  00003800
//              VOLUME=(PRIVATE,RETAIN,SER=&SERIAL),                        00003900
//              DISP=(&DISP),                                               00004000
//              SPACE=(&SPCUNIT,(&PRIMARY,&SECNDRY),RLSE),                  00004100
//              DSNAME=&PROJECT..DATA.&NEWMSTR                              00004200
//*                                                                         00004300
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                                   00004400
//*                                                                         00004500
//PNRPRINT  DD SYSOUT=&OUT                                                  00004600
//*                                                                         00004700
//* OUTPUT DATA SETS - SYSTEM OPERATION                                     00004800
//*                                                                         00004900
//SYSPRINT  DD SYSOUT=&OUT                                                  00005000
//*                                                                         00005100
//SYSOUT    DD SYSOUT=&OUT                                                  00005200
//*                                                                         00005300
//SYSDBOUT  DD SYSOUT=&OUT                                                  00005400
//*                                                                         00005500
//SYSDTERM  DD SYSOUT=&OUT                                                  00005600
//*                                                                         00005700
//SYSUDUMP  DD SYSOUT=&OUT                                                  00005800
```

```
FNRFUPDT
          //*                                                                   00005900
```

PNRHREPT - NEDS AREA SOURCE REPORT

PNRHREPT is executed to produce a formatted listing of NEDS area source records. The input to the program consists of NEDS area source records, defined by PNRNEDS. There are two output files used by the program. The first, defined by PNRPRINT, contains diagnostic messages produced during the reporting process. The second, defined as PNREPORT, contains the formatted listing of the NEDS records.


NEDS Area
Source Cards
HXANREPT
Program
Diagnostic
Messages
NEDS Area
Source
Listing

PNRHREPT - Data Flow
Figure A-7

DDNAME	Description
PNRNEDS	NEDS area source records to be listed
PNREPORT	Print file for Area Source Listing
PNRPRINT	Print file for diagnostic messages.

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	HXANREPT	Program to list NEDS area source records
NEDSFIL	NEDS	Lowest level index of NEDS File to be listed
OUT	A	SYSOUT class of all print files.

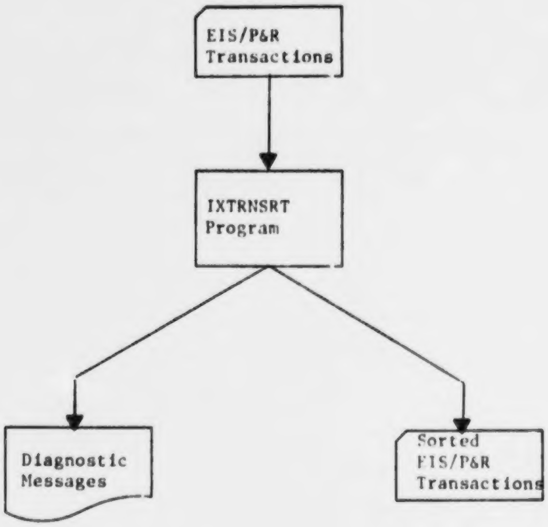
PNRHREPT - Substitutable Parameters

PNRHREPT

```
//*            PNRHREPT                  HURLEY RF        WF4   01/31/75 00000100
//*                                                                    00000200
//PNRHREPT PROC PROJECT='SYS2.PNR',                                    00000300
//             PROGRAM=HXANREPT,                                       00000400
//             NEDSFIL=NEDS,                                           00000500
//             OUT=A                                                   00000600
//*                                                                    00000700
//REPORT  EXEC PGM=&PROGRAM,                                           00000800
//             REGION=40K,                                             00000900
//             TIME=(1,0)                                              00001000
//*                                                                    00001100
//* PRODUCE NEDS AREA SOURCE DETAIL REPORT                             00001200
//*                                                                    00001300
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                  00001400
//             VOLUME=(PRIVATE,RETAIN),                                00001500
//             DISP=(SHR,PASS)                                         00001600
//*                                                                    00001700
//* INPUT DATA SET - NEDS AREA SOURCE FILE                             00001800
//*                                                                    00001900
//PNRNEDS   DD DSNAME=&PROJECT..DATA.&NEDSFIL,                         00002000
//             VOLUME=(PRIVATE,RETAIN),                                00002100
//             DISP=(SHR,PASS)                                         00002200
//*                                                                    00002300
//* OUTPUT FILE - NEDS AREA SOURCE DETAIL REPORT                       00002400
//*                                                                    00002500
//PNREPORT  DD SYSOUT=&OUT                                             00002600
//*                                                                    00002700
//* OUTPUT FILE - DIAGNOSTIC MESSAGES                                  00002800
//*                                                                    00002900
//PNRPRINT  DD SYSOUT=&OUT                                             00003000
//*                                                                    00003100
//* OUTPUT DATA SETS - SYSTEM OPERATION                                00003200
//*                                                                    00003300
//SYSPRINT  DD SYSOUT=&OUT                                             00003400
//*                                                                    00003500
//SYSOUT    DD SYSOUT=&OUT                                             00003600
//*                                                                    00003700
//SYSCBOUT  DD SYSOUT=&OUT                                             00003800
//*                                                                    00003900
//SYSOTERM  DD SYSOUT=&OUT                                             00004000
//*                                                                    00004100
//SYSUDUMP  DD SYSOUT=&OUT                                             00004200
//*                                                                    00004300
```

PNRISORT - EIS/P&R TRANSACTION SORT

PNRISORT is executed to sort sets of EIS/P&R file maintenance transaction records into an order acceptable to the File Maintenance program. The input to the Transaction Sort program consists of a set of EIS/P&R transactions, defined by PNRINPUT. There are two output files used by the Transaction Sort program. The first, defined by PNRTRANS, contains EIS/P&R file maintenance transactions sorted by the Sort program. The second, defined by PNRPRINT, contains diagnostic messages generated during the sort process and a listing of the sorted transactions.


EIS/P&R
Transactions
IXTRNSRT
Program
Diagnostic
Messages
Sorted
EIS/P&R
Transactions

PNRISORT - Data Flow
Figure A-8

DDNAME	**Description**
PNRINPUT	EIS/P&R file maintenance transactions to be sorted
PNRTRANS	Data set to contain sorted EIS/P&R file maintenance transactions
PNRPRINT	Print file for diagnostic messages.

PNRISORT - DDNAMES

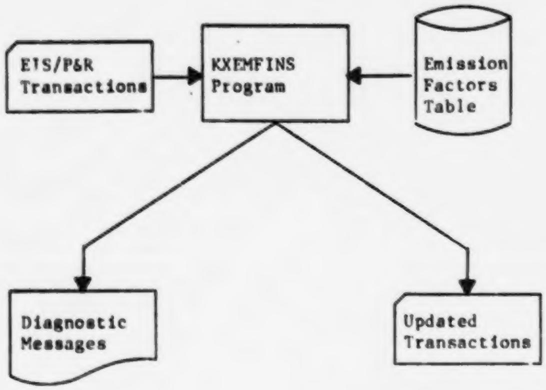
Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	IXTRNSRT	Program to sort the EIS/P&R file maintenance transactions
TEMP	SYSDA	Unit type to be used for temporary work space
SORTSPC	20	Number of units to be allocated for EIS/P&R transactions' sort space allocation
OUT	A	SYSOUT class for all print files.

PNRISORT - Substitutable Parameters

```
//*              PNRISORT                   HURLEY RF        WF4   01/31/75 00000100
//*                                                                        00000200
//PNRISORT PROC PROJECT='SYS2.PNR',                                        00000300
//              PROGRAM=IXTRNSRT,                                          00000400
//              TEMP=SYSDA,                                                00000500
//              SORTSPC=20,                                                00000600
//              OUT=A                                                      00000700
//*                                                                        00000800
//SORT    EXEC PGM=&PROGRAM,                                               00000900
//              REGION=60K,                                                00001000
//              TIME=(1,0)                                                 00001100
//*                                                                        00001200
//* SORT FILE MAINTENANCE TRANSACTIONS                                     00001300
//*                                                                        00001400
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                      00001500
//              VOLUME=(PRIVATE,RETAIN),                                   00001600
//              DISP=(SHR,PASS)                                            00001700
//*                                                                        00001800
//* INPUT DATA SET - UNSORTED FILE MAINTENANCE TRANSACTIONS                00001900
//*                                                                        00002000
//PNRINPUT  DD DDNAME=INPLT,                                               00002100
//              DCB=BLKSIZE=80                                             00002200
//*                                                                        00002300
//* OUTPUT DATA SET - SORTED FILE MAINTENANCE TRANSACTIONS                 00002400
//*                                                                        00002500
//PNRTRANS  DD DDNAME=OUTPLT,                                              00002600
//              DCB=BLKSIZE=80                                             00002700
//*                                                                        00002800
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                                  00002900
//*                                                                        00003000
//PNRPRINT  DD SYSOUT=&OUT                                                 00003100
//*                                                                        00003200
//* SORT/MERGE DATA SETS                                                   00003300
//*                                                                        00003400
//SORTLIB   DD DSNAME=SYS1.SORTLIB,                                        00003500
//              DISP=(SHR,PASS)                                            00003600
//*                                                                        00003700
//SORTWK01  DD UNIT=&TEMP,                                                 00003800
//              SPACE=(TRK,&SORTSPC,,CONTIG)                               00003900
//*                                                                        00004000
//SORTWK02  DD UNIT=(&TEMP,SEP=SORTWK01),                                  00004100
//              SPACE=(TRK,&SORTSPC,,CONTIG)                               00004200
//*                                                                        00004300
//SORTWK03  DD UNIT=(&TEMP,SEP=(SORTWK01,SORTWK02)),                       00004400
//              SPACE=(TRK,&SORTSPC,,CONTIG)                               00004500
//*                                                                        00004600
//* OUTPUT DATA SETS - SYSTEM OPERATION                                    00004700
//*                                                                        00004800
//SYSPRINT  DD SYSOUT=&OUT                                                 00004900
//*                                                                        00005000
//SYSOUT    DD SYSOUT=&OUT                                                 00005100
//*                                                                        00005200
//SYSDBOUT  DD SYSOUT=&OUT                                                 00005300
//*                                                                        00005400
//SYSDTERM  DD SYSOUT=&OUT                                                 00005500
//*                                                                        00005600
//SYSUDUMP  DD SYSOUT=&OUT                                                 00005700
//*                                                                        00005800
```

PNRKEFIN - EMISSION FACTORS INSERT

PNRKEFIN is executed to insert emission factors into the EIS/P&R file maintenance transactions. There are two input files used by the Insertion program. The first, defined by PNRINPUT, contains the EIS/P&R transactions into which the emission factors are to be inserted. The second, defined by PNREFTBL, contains the emission factors table. There are two output files used by the Insertion program. The first, defined by PNRTRANS, contains the EIS/P&R transactions into which the emission factors have been inserted. The second, defined by PNRPRINT, contains diagnostic messages generated during the insertion process.


EIS/P&R Transactions
KXEMFINS Program
Emission Factors Table
Diagnostic Messages
Updated Transactions

PNRKEFIN - Data Flow
Figure A-9

DDNAME	Description
PNRINPUT	EIS/P&R transactions into which emission factors are to be inserted
PNREFTBL	Emission factors table
PNRTRANS	Data set to contain EIS/P&R transactions into which emission factors have been inserted
PNRPRINT	Print file for diagnostic messages.

PNRKEFIN - DDNAMES

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	KXEMFINS	Program to insert emission factors into EIS/P&R transactions
EFTABLE	EFTABLE	Lowest level index of emission factors table
OUT	A	SYSOUT class of all print files.

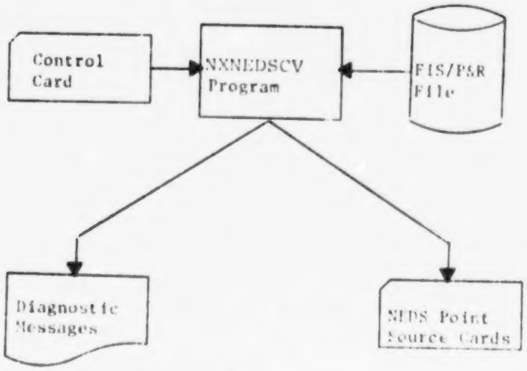
PNRKEFIN - Substitutable Parameters

FNRKEFIN

```
//*            PNRKEFIN                  HURLEY RF        WF4   01/31/75
//*
//PNRKEFIN PROC PROJECT='SYS2.PNR',
//              PROGRAM=KXEMFINS,
//              EFTABLE=EFTABLE,
//              OUT=A
//*
//INSERT  EXEC PGM=&PROGRAM,
//              PEGION=60K,
//              TIME=(1,0)
//*
//* INSERT EMISSION FACTORS INTO FILE MAINTENANCE TRANSACTIONS
//*
//STEPLIB   DD DSNAME=&PROJECT..LOAD,
//              VOLUME=(PRIVATE,RETAIN),
//              DISP=(SHR,PASS)
//*
//* INPUT DATA SET - FILE MAINTENANCE TRANSACTIONS
//*
//PNRINPUT  DD DDNAME=INPUT,
//              DCB=BLKSIZE=80
//*
//* INPUT DATA SET - EMISSION FACTORS TABLE FILE
//*
//PNREFTBL  DD DSNAME=&PROJECT..DATA.&EFTABLE,
//              VOLUME=(PRIVATE,RETAIN),
//              DISP=(SHR,PASS)
//*
//* OUTPUT DATA SET - FILE MAINTENANCE TRANSACTIONS
//*
//PNRTRANS  DD DDNAME=OUTPUT,
//              DCB=BLKSIZE=80
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//PNRPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SETS - SYSTEM OPERATION
//*
//SYSPRINT  DD SYSOUT=&OUT
//*
//SYSOUT    DD SYSOUT=&OUT
//*
//SYSDBOUT  DD SYSOUT=&OUT
//*
//SYSDTERM  DD SYSOUT=&OUT
//*
//SYSUDUMP  DD SYSOUT=&OUT
//*
```

PNRNCONV - NEDS POINT SOURCE FILE OUTPUT

PNRNCONV is executed to produce NEDS point source data from EIS/P&R file records. There are two input files used by the program. The first, defined by PNRINPUT, contains the control card to indicate whether the transactions generated will be A, C or D. The second, defined by PNRMASTR, contains the EIS/P&R File (either Master or Answer). There are two output files used by the program. The first, defined by PNRNEDS, contains the NEDS point source records produced by the program. The second, defined by PNRPRINT, contains diagnostic messages generated during the output process.


Control Card
NXNEDSCV Program
FIS/P&R File
Diagnostic Messages
NEDS Point Source Cards

PNRNCONV - Data Flow
Figure A-10

DDNAME	Description
PNRINPUT	Control Card
PNRMASTR	EIS/P&R Master File
PNRNEDS	Data set to contain generated NEDS records
PNRPRINT	Print file for diagnostic messages.

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	NXNEDSCV	Program to convert EIS/P&R point source file to NEDS point source records
MSTRFIL	FTMSTRAA	Lowest level index of EIS/P&R File to be converted
NEDSOUT	B	SYSOUT class of punched NEDS records
OUT	A	SYSOUT class of all print files.

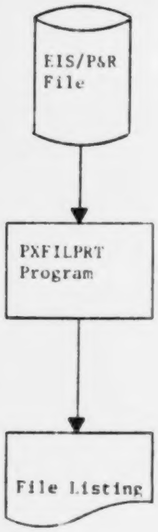
PNRNCONV - Substitutable Parameters

PNRNCCNV

```
//*             PNRNCONV                   HURLEY RF          WF4    01/31/75
//*
//PNRNCONV PROC PROJECT='SYS2.PNR',
//              PROGRAM=NXNEDSCV,
//              MSTRFIL=FTMSTRAA,
//              NEDSOUT=B,
//              OUT=A
//*
//CONVERT EXEC PGM=&PROGRAM,
//              REGICN=20K,
//              TIME=(1,0)
//*
//* CCNVERT EIS/PER POINT SOURCE FILE TO NEDS FORMAT
//*
//STEPLIB   DD DSNAME=&PROJECT..LOAD,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* INPUT DATA SET - CCNTRCL CARD
//*
//PNRINPUT  DD DDNAME=!INPUT,
//             DCB=BLKSIZE=80
//*
//* INPUT DATA SET - EIS/PER MASTER FILE
//*
//PNRMASTR  DD DSNAME=&PROJECT..DATA.&MSTRFIL,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* OUTPUT DATA SET - NEDS FILE
//*
//PNRNEDS   DD SYSOUT=&NEDSCUT
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//PNRPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SETS - SYSTEM OPERATION
//*
//SYSPRINT  DD SYSOUT=&CUT
//*
//SYSOUT    DD SYSOUT=&CUT
//*
//SYSDBOUT  DD SYSOUT=&OUT
//*
//SYSDTERM  DD SYSOUT=&OUT
//*
//SYSUDUMP  DD SYSOUT=&OUT
//*
```

PNRPREPT - EIS/P&R FILE LIST OUTPUT

PNRPREPT is executed to produce a detailed listing of an EIS/P&R File. The input to the File List program consists of an EIS/P&R File (either Master or Answer), defined by PNRMASTR. The output from the File List program, consisting of a detailed listing of each record in the file, is defined by PNRPRINT.


EIS/P&R File
PXFILPRT Program
File Listing

PNRPREPT - Data Flow
Figure A-11

DDNAME	Description
PNRMASTR	EIS/P&R File to be listed
PNRPRINT	Print file for EIS/P&R File listing.

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	PXFILPRT	Program to format and list the EIS/P&R File
MSTRFIL	FTMSTRAA	Lowest level index of EIS/P&R File (Master or Answer) to be listed
OUT	A	SYSOUT class of all print files.

PNRPREPT - Substitutable Parameters

```
//*             PNRPREPT                  HURLEY RF        WF4   01/31/75
//*
//PNRPREPT PROC PROJECT='SYS2.PNR',
//              PROGRAM=PXFILPRT,
//              MSTRFIL=FTMSTRAA,
//              OUT=A
//*
//REPORT  EXEC PGM=&PROGRAM,
//              TIME=(1,0),
//              REGION=24K
//*
//* FORMAT EIS/PER MASTER FILE
//*
//STEPLIB    DD DSNAME=&PROJECT..LOAD,
//              VOLUME=(PRIVATE,RETAIN),
//              DISP=(SHR,PASS)
//*
//* INPUT DATA SET - EIS/PER MASTER FILE
//*
//PNRMASTR  DD DSNAME=&PROJECT..DATA.&MSTRFIL,
//              VOLUME=(PRIVATE,RETAIN),
//              DISP=(SHR,PASS)
//*
//* OUTPUT DATA SET - FORMATTED LISTING OF EIS/PER MASTER FILE
//*
//PNRPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SETS - SYSTEM OPERATION
//*
//SYSPRINT  DD SYSOUT=&OUT
//*
//SYSOUT    DD SYSOUT=&OUT
//*
//SYSDBOUT  DD SYSOUT=&OUT
//*
//SYSDTERM  DD SYSOUT=&OUT
//*
//SYSUDUMP  DD SYSOUT=&OUT
//*
```

PNRRETVR - RETRIEVAL

PNRRETVR is executed to retrieve an Answer File from the EIS/P&R Master File. The procedure consists of five separate steps.

The first step, the retrieval language processor, generates a COBOL program to perform the actual retrieval of the Answer File. There are two input data sets used by the language processor. The first, defined by PNRINPGM, contains the skeleton of the COBOL retrieval program to be generated. The second, defined by PNRINPUT, consists of retrieval query cards specifying the qualifications of the Answer File to be retrieved. There are two output data sets used by the language processor. The first, defined by PNRETRVR, contains the COBOL source code produced by the language processor. The second, defined by PNRPRINT, contains the diagnostic messages generated during the language processing process.

The second step, the COBOL compiler, compiles the source code produced by the language processor and produces an object module which is passed to the third step, the linkage editor. The linkage editor combines the retriever object code with COBOL subroutines and produces an executable load module of the Retriever program.

The fourth step, the retriever, processes the EIS/P&R Master File and produces the Answer File. The input to the retriever consists of the EIS/P&R Master File defined by PNRMASTR. There are two output files used by the retriever. The first, defined by PNRANSWR, contains the Answer File produced by the retriever. The second, defined by PNRPRINT, contains diagnostic messages generated during the retrieval process.

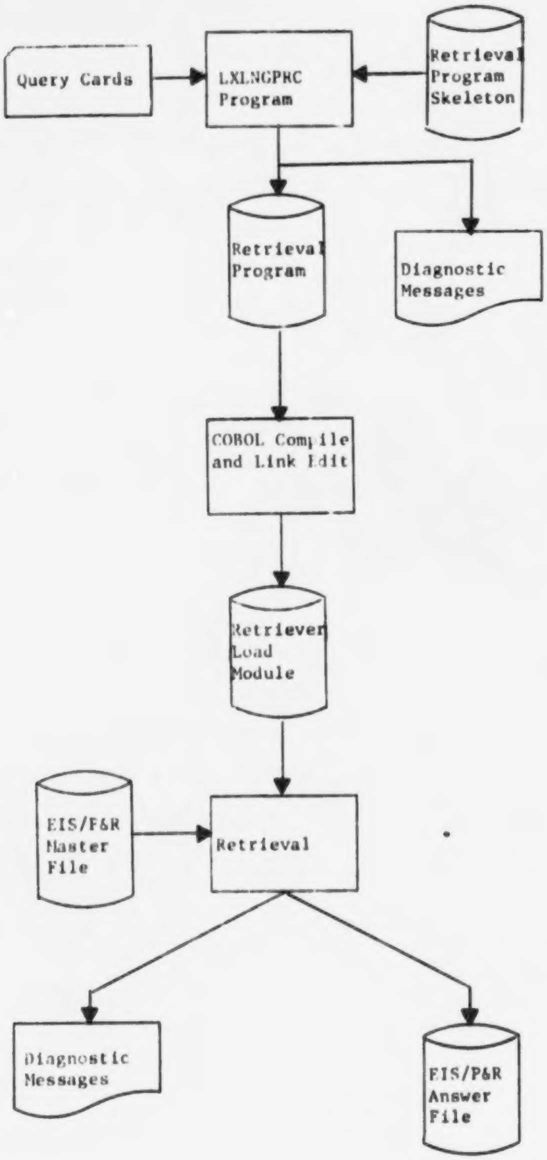
The fifth and final step, the delete step, deletes the output retriever load module, defined by LOADMOD, created by the linkage editor.

If the user wished to save the load module created by the third step, he could override the SYSLMOD DD card with a statement similar to the following:

```
//LKED.SYSLMOD  DD  DSNAME=SYS2.PNR.LOAD(RETRVR01),
//                  DISP=(MOD,KEEP)
```

This statement will cause the load module to be named RETRVR01 and to be saved in the load library named SYS2.PNR.LOAD. If a load module named RETRVR01 already exists in the library and the user wished to replace it, he should code the same statement with the following exception:

```
//                  DISP=(OLD,KEEP)
```


Query Cards
LXLNGPRC Program
Retrieval Program Skeleton
Retrieval Program
Diagnostic Messages
COBOL Compile and Link Edit
Retriever Load Module
EIS/F&R Master File
Retrieval
Diagnostic Messages
EIS/P&R Answer File

PNRRETVR - Data Flow
Figure A-12

DDNAME	Description
PNRINPGM	COBOL skeleton retriever code
PNRINPUT	Retrieval query cards
PNRETRVR	COBOL retrieval program source code
PNRPRINT	Print file for diagnostic messages
PNRMASTR	EIS/P&R Master File from which Answer File is to be retrieved
PNRANSWR	Answer file retrieved from EIS/P&R Master File
LOADMOD	Output retriever load module created by the linkage editor.

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	LXLNGPRC	Program to generate retrieval program
PARAM	'SIZE=94K, BUF=10K, NOSEQ,SUPMAP, NOSOURCE'	COBOL parameters for compile
TEMP	SYSDA	Unit type for temporary work space
MSTRFIL	FTMSTRAA	Lowest level index of EIS/P&R Master File from which Answer File is to be retrieved
ANSWRFL	RTANSRAA	Lowest level index of EIS/P&R Answer File
UNIT	2314	Unit type upon which Answer File is to reside
SERIAL	RTCC02	Volume serial of volume upon which Answer File is to reside
DISP	'NEW,PASS, DELETE'	Disposition of Answer File
SPCUNIT	TRK	Units in which space for Answer File is to be allocated

PNRRETVR - Substitutable Parameters

PRIMARY	20	Number of units to be allocated for Answer File's primary allocation
SECNDRY	10	Number of units to be allocated for Answer File's secondary allocation
MEMBER	RTRETRVR	Skeleton input program to the language processing program
OUT	A	SYSOUT class for all print files.

PNRRETVR - Substitutable Parameters

ARRETVR

```
//*              PNRRETVR                   HURLEY RF        WF4  01/31/75  00000100
//*                                                                         00000200
//PNRRETVR PROC PROJECT='SYS2.PNR',                                         00000300
//              PROGRAM=LXLNGPRC,                                           00000400
//              PARAM='SIZE=94K,BUF=10K,NOSEQ,SUPMAP,NOSOURCE',             00000500
//              TEMP=SYSDA,                                                 00000600
//              MSTRFIL=FTMSTRAA,                                           00000700
//              ANSWRFL=RTANSRAA,                                           00000800
//              UNIT=2314,                                                  00000900
//              SERIAL=RTC002,                                              00001000
//              DISP='NEW,PASS,DELETE',                                     00001100
//              SPCUNIT=TRK,                                                00001200
//              PRIMARY=20,                                                 00001300
//              SECNDRY=10,                                                 00001400
//              MEMBER=RTRETRVR,                                            00001500
//              OUT=A                                                       00001600
//*                                                                         00001700
//COMPILE EXEC PGM=&PROGRAM,                                                00001800
//              REGION=60K,                                                 00001900
//              TIME=(1,0)                                                  00002000
//*                                                                         00002100
//* PRODUCE EIS/PER RETRIEVAL PROGRAM                                       00002200
//*                                                                         00002300
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                       00002400
//              VOLUME=(PRIVATE,RETAIN),                                    00002500
//              DISP=(SHR,PASS)                                             00002600
//*                                                                         00002700
//* INPUT DATA SET - RETRIEVAL PROGRAM SKELETON                             00002800
//*                                                                         00002900
//PNRINPGM  DD DSNAME=&PROJECT..TEST(&MEMBER),                              00003000
//              VOLUME=(PRIVATE,RETAIN),                                    00003100
//              DISP=(SHR,PASS)                                             00003200
//*                                                                         00003300
//* INPUT DATA SET - RETRIEVAL SPECIFICATION CARDS                          00003400
//*                                                                         00003500
//PNRINPUT  DD DDNAME=INPUT,                                                00003600
//              DCB=BLKSIZE=80                                              00003700
//*                                                                         00003800
//* OUTPUT DATA SET - RETRIEVAL PROGRAM                                     00003900
//*                                                                         00004000
//PNRETRVR  DD UNIT=&TEMP,                                                  00004100
//              DISP=(NEW,PASS),                                            00004200
//              SPACE=(TRK,(5,2),RLSE),                                     00004300
//              DSNAME=&&PROGRAM                                            00004400
//*                                                                         00004500
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                                   00004600
//*                                                                         00004700
//PNRPRINT  DD SYSOUT=&OUT                                                  00004800
//*                                                                         00004900
//* OUTPUT DATA SETS - SYSTEM OPERATION                                     00005000
//*                                                                         00005100
//SYSPRINT  DD SYSOUT=&OUT                                                  00005200
//*                                                                         00005300
//SYSOUT    DD SYSOUT=&OUT                                                  00005400
//*                                                                         00005500
//SYSOBOUT  DD SYSOUT=&OUT                                                  00005600
//*                                                                         00005700
//SYSDTERM  DD SYSOUT=&OUT                                                  00005800
```

FNRRETVR

```
//*                                                                     00005900
//SYSUDUMP  DD SYSOUT=&OUT                                              00006000
//*                                                                     00006100
//COBOL    EXEC PGM=IKFCBL00,                                           00006200
//              PARM='&PARAM',                                          00006300
//              REGION=100K,                                            00006400
//              TIME=(2,0)                                              00006500
//*                                                                     00006600
//* COMPILE RETRIEVAL PROGRAM                                           00006700
//*                                                                     00006800
//*                                                                     00006900
//* INPUT DATA SET - SOURCE LIBRARY                                     00007000
//*                                                                     00007100
//SYSLIB     DD DSNAME=&PROJECT..SOURCE,                                00007200
//              VOLUME=(PRIVATE,RETAIN),                                00007300
//              DISP=(SHR,PASS)                                         00007400
//*                                                                     00007500
//* INPUT DATA SET - COBOL RETRIEVAL PROGRAM SOURCE CODE                00007600
//*                                                                     00007700
//SYSIN      DD DSNAME=&&PROGRAM,                                       00007800
//              DISP=(OLD,DELETE)                                       00007900
//*                                                                     00008000
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                               00008100
//*                                                                     00008200
//SYSPRINT  DD SYSOUT=&OUT                                              00008300
//*                                                                     00008400
//* OUTPUT DATA SET - COBOL RETRIEVAL PROGRAM OBJECT CODE               00008500
//*                                                                     00008600
//SYSLIN     DD UNIT=&TEMP,                                             00008700
//              DISP=(NEW,PASS),                                        00008800
//              SPACE=(TRK,(5,2),RLSE),                                 00008900
//              DSNAME=&&OBJMOD                                         00009000
//*                                                                     00009100
//* UTILITY DATA SETS                                                   00009200
//*                                                                     00009300
//SYSUT1     DD UNIT=&TEMP,                                             00009400
//              SPACE=(TRK,(50,100))                                    00009500
//*                                                                     00009600
//SYSUT2     DD UNIT=(&TEMP,SEP=SYSUT1),                                00009700
//              SPACE=(TRK,(50,100))                                    00009800
//*                                                                     00009900
//SYSUT3     DD UNIT=(&TEMP,SEP=(SYSUT1,SYSUT2)),                       00010000
//              SPACE=(TRK,(50,100))                                    00010100
//*                                                                     00010200
//SYSUT4     DD UNIT=(&TEMP,SEP=(SYSUT1,SYSUT2,SYSUT3)),                00010300
//              SPACE=(TRK,(50,100))                                    00010400
//*                                                                     00010500
//LKED     EXEC PGM=IEWL,                                               00010600
//              PARM='LIST,LET,XREF',                                   00010700
//              COND=(5,LT,COBOL),                                      00010800
//              REGION=100K,                                            00010900
//              TIME=(1,0)                                              00011000
//*                                                                     00011100
//* LINK-EDIT RETRIEVAL                                                 00011200
//*                                                                     00011300
//*                                                                     00011400
//* INPUT DATA SET - AUTO-CALL LIBRARY                                  00011500
//SYSLIB     DD DSNAME=&PROJECT..LOAD,                                  00011600
```

```
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//          DD DSNAME=SYS1.COBLIB,
//             DISP=(SHR,PASS)
//*
//* INPUT DATA SET - COBOL RETRIEVAL PROGRAM OBJECT CODE
//*
//SYSLIN    DD DSNAME=&&OBJMOD,
//             DISP=(OLD,DELETE)
//          DD DDNAME=INPLT,
//             DCB=BLKSIZE=80
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//SYSPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SET - COBOL RETRIEVAL PROGRAM LOAD MODULE
//*
//SYSLMOD   DD UNIT=&TEMP,
//             DISP=(MOD,PASS),
//             SPACE=(TRK,(10,5,1)),
//             DSNAME=&&LOADMOD(RETRIEVE)
//*
//* UTILITY DATA SET
//*
//SYSUT1    DD UNIT=&TEMP,
//             SPACE=(TRK,(10,5))
//*
//RETRIEVE EXEC PGM=*.LKED.SYSLMOD,
//             COND=((5,LT,COBOL),(5,LT,LKED)),
//             REGION=60K,
//             TIME=(1,0)
//*
//* RETRIEVE ANSWER FILE FROM EIS/PER MASTER FILE
//*
//STEPLIB   DD DSNAME=&PROJECT..LOAD,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* INPUT DATA SET - EIS/PER MASTER FILE
//*
//PNRMASTR  DD DSNAME=&PROJECT..DATA.&MSTRFIL,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* OUTPUT DATA SET - ANSWER FILE
//*
//PNRANSWR  DD UNIT=&UNIT,
//             VOLUME=(PRIVATE,RETAIN,SER=&SERIAL),
//             DISP=(&DISP),
//             SPACE=(&SPCUNIT,(&PRIMARY,&SECNDRY),RLSE),
//             DSNAME=&PROJECT..DATA.&ANSWRFL
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//PNRPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SETS - SYSTEM OPERATION
```

PNRRETVR

```
//*                                                                     00017500
//SYSPRINT  DD SYSOUT=&OUT                                              00017600
//*                                                                     00017700
//SYSOUT    DD SYSOUT=&OUT                                              00017800
//*                                                                     00017900
//SYSDBOUT  DD SYSOUT=&OUT                                              00018000
//*                                                                     00018100
//SYSDTERM  DD SYSOUT=&OUT                                              00018200
//*                                                                     00018300
//SYSUDUMP  DD SYSOUT=&OUT                                              00018400
//*                                                                     00018500
//DELETE  EXEC PGM=IEFBR14,                                             00018600
//             REGION=4K,                                               00018700
//             TIME=(0,5)                                               00018800
//LOADMOD   DD DSNAME=&&LOADMOD,                                        00018900
//             DISP=(OLD,DELETE)                                        00019000
//*                                                                     00019100
```

PNRSORTR - EIS/P&R MASTER FILE SORT

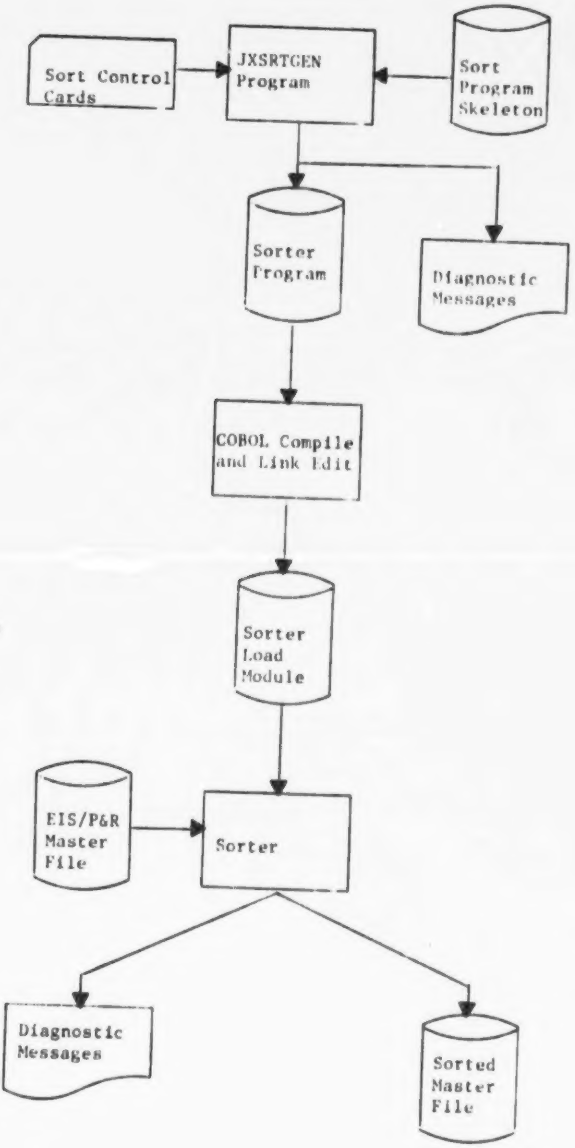
PNRSORTR is executed to sort an EIS/P&R Master File in an order specified by the user and produce an Answer File consisting of the sorter records. The procedure consists of five separate steps.

The first step, the Master File Sorter Generator, generates a COBOL program which will perform the actual sort of the EIS/P&R Master File. There are two input data sets used by the Master File Sorted Generator. The first, defined by PNRINPGM, contains the skeleton of the COBOL Master File Sorter program to be generated. The second, defined by PNRINPUT, consists of control and sort statements specifying the sort fields and their order for the Sorted Answer File. There are two output data sets used. The first, defined by PNRSORTR, contains the COBOL source code produced by the Master File Sorter Generator program. The second, defined by PNRPRINT, contains the diagnostic messages generated during the generation process.

The second step, the COBOL compiler, compiles the source code produced by the Master File Sorter Generator and produces an object module which is passed to the third step, the linkage editor. The linkage editor combines the Master File sorter object code with COBOL subroutines and produces an executable load module of the Master File Sorter program.

The fourth step, the Master File Sorter, processes the EIS/P&R Master File and produces the Sorted Answer File. The input to the Master File Sorter, defined by PNRINPUT, consists of an EIS/P&R Master File. There are two output files used by the Master File Sorter. The first, defined by PNRMASTR, contains the Output Sorted File produced by the Master File Sorter. The second, defined by PNRPRINT, contains diagnostic messages generated during the sorter process.

The fifth and final step, the delete step, deletes the output sorter load module, defined by LOADMOD, created by the linkage editor.


Sort Control Cards
JXSRTGEN Program
Sort Program Skeleton
Sorter Program
Diagnostic Messages
COBOL Compile and Link Edit
Sorter Load Module
EIS/P&R Master File
Sorter
Diagnostic Messages
Sorted Master File

PNRSORTR - Data Flow
Figure A-13

DDNAME	Description
PNRINPGM	COBOL skeleton master file sorter code
PNRINPUT (step 1)	Control and sort statement cards
PNRSORTR	COBOL master file sorter program source code
PNRPRINT	Print file for diagnostic messages
PNRINPUT (step 2)	EIS/P&R Master File from which sorted file is to be generated
PNRMASTR	Sorted file generated from the EIS/P&R Master File
LOADMOD	Output sorter load module created by the linkage editor.

PNRSORTR - DDNAMES

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PARAM	'SIZE=94K,NOSEQ,SUPMAP,NOSOURCE'	COBOL parameters for compile
PROGRAM	JXSRTGEN	Program to generate the Master File Sorter
TEMP	SYSDA	Unit type for temporary work space
MSTRFIL	FTMSTRAA	Lowest level index of EIS/P&R Master File from which the sorted file is to be generated
SORTFIL	STSORTAA	Lowest level index of EIS/P&R Sorted File
UNIT	2314	Unit type upon which Sort File is to reside
SERIAL	RTCC02	Volume serial of volume upon which the Sort File is to reside
DISP	'NEW,PASS,DELETE	Disposition of Sorted File
SPCUNIT	TRK	Units in which space for the Sorted File is to be allocated
PRIMARY	20	Number of units to be allocated for the Sorted File's primary allocation

PNRSORTR - Substitutable Parameters

SECNDRY	10	Number of units to be allocated for the Sorted File's secondary allocation
MEMBER	STMSTSRT	Skeleton input program to the Master File Sorter Generator
SORTSPC	50	Number of units to be allocated for the sort's work space
OUT	A	SYSOUT class of all print files.

PNRSORTR - Substitutable Parameters

```
//*             PNRSORTR                     HURLEY RF        WF4  01/31/75
//*
//PNRSORTR PROC PROJECT='SYS2.PNR',
//              PROGRAM=JXSRTGEN,
//              PARAM='SIZE=94K,BUF=10K,NOSEQ,SUPMAP,NOSOURCE',
//              TEMP=SYSDA,
//              MSTRFIL=FTMSTRAA,
//              SORTFIL=STSORTAA,
//              UNIT=2314,
//              SERIAL=RTC002,
//              DISP='NEW,PASS,DELETE',
//              SPCUNIT=TRK,
//              PRIMARY=20,
//              SECNDRY=10,
//              MEMBER=STMSTSRT,
//              SORTSPC=50,
//              OUT=A
//*
//COMPILE EXEC PGM=&PROGRAM,
//              REGION=60K,
//              TIME=(1,0)
//*
//* PRODUCE EIS/P&R MASTER FILE SORTER PROGRAM
//*
//STEPLIB   DD DSNAME=&PROJECT..LOAD,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* INPUT DATA SET - SORTER PROGRAM SKELETON
//*
//PNRINPGM  DD DSNAME=&PROJECT..TEST(&MEMBER),
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* INPUT DATA SET - SORT SPECIFICATION CARDS
//*
//PNRINPUT  DD DDNAME=INPUT,
//             DCB=BLKSIZE=80
//*
//* OUTPUT DATA SET - SORTER PROGRAM
//*
//PNRSORTR  DD UNIT=&TEMP,
//             DISP=(NEW,PASS),
//             SPACE=(TRK,(5,2),RLSE),
//             DSNAME=&&PROGRAM
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//PNRPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SETS - SYSTEM OPERATION
//*
//SYSPRINT  DD SYSOUT=&OUT
//*
//SYSOUT    DD SYSOUT=&OUT
//*
//SYSDBOUT  DD SYSOUT=&OUT
//*
```

FNRSORTR

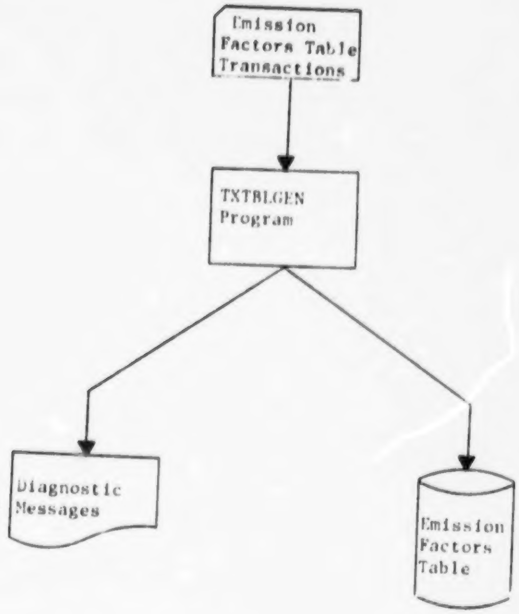
```
//SYSDTERM  DD SYSOUT=&OUT
//*
//SYSUDUMP  DD SYSOUT=&OUT
//*
//COBOL   EXEC PGM=IKFCBLCO,
//             PARM='&PARAM',
//             REGION=100K,
//             TIME=(2,0)
//*
//* COMPILE SORTER PROGRAM
//*
//*
//* INPUT DATA SET - SOURCE LIBRARY
//*
//SYSLIB    DD DSNAME=&PROJECT..SOURCE,
//             VOLUME=(PRIVATE,RETAIN),
//             DISP=(SHR,PASS)
//*
//* INPUT DATA SET - COBOL SORTER PROGRAM SOURCE CODE
//*
//SYSIN     DD DSNAME=&&PROGRAM,
//             DISP=(OLD,DELETE)
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//SYSPRINT  DD SYSOUT=&OUT
//*
//* OUTPUT DATA SET - COBOL SORTER PROGRAM OBJECT CODE
//*
//SYSLIN    DD UNIT=&TEMP,
//             DISP=(NEW,PASS),
//             SPACE=(TRK,(5,2),RLSE),
//             DSNAME=&&OBJMOD
//*
//* UTILITY DATA SETS
//*
//SYSUT1    DD UNIT=&TEMP,
//             SPACE=(TRK,(50,100))
//*
//SYSUT2    DD UNIT=(&TEMP,SEP=SYSUT1),
//             SPACE=(TRK,(50,100))
//*
//SYSUT3    DD UNIT=(&TEMP,SEP=(SYSUT1,SYSUT2)),
//             SPACE=(TRK,(50,100))
//*
//SYSUT4    DD UNIT=(&TEMP,SEP=(SYSUT1,SYSUT2,SYSUT3)),
//             SPACE=(TRK,(50,100))
//*
//LKED    EXEC PGM=IEWL,
//             PARM='LIST,LET,XREF',
//             COND=(5,LT,COBOL),
//             REGION=100K,
//             TIME=(1,0)
//*
//* LINK-EDIT SORTER
//*
//*
//* INPUT DATA SET - AUTO-CALL LIBRARY
```

```
//SYSLIB     DD DSNAME=&PROJECT..LOAD,
//               VOLUME=(PRIVATE,RETAIN),
//               DISP=(SHR,PASS)
//           DD DSNAME=SYS1.COBLIB,
//               DISP=(SHR,PASS)
//*
//* INPUT DATA SET - COBOL SORTER PROGRAM OBJECT CODE
//*
//SYSLIN     DD DSNAME=&&OBJMOD,
//               DISP=(OLD,DELETE)
//           DD DDNAME=INPUT,
//               DCB=BLKSIZE=80
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//SYSPRINT   DD SYSOUT=&OUT
//*
//* OUTPUT DATA SET - COBOL SORTER PROGRAM LOAD MODULE
//*
//SYSLMOD    DD UNIT=&TEMP,
//               DISP=(MOD,PASS),
//               SPACE=(TRK,(10,5,1)),
//               DSNAME=&&LOADMOD(SORTER)
//*
//* UTILITY DATA SET
//*
//SYSUT1     DD UNIT=&TEMP,
//               SPACE=(TRK,(10,5))
//*
//SORT     EXEC PGM=*.LKED.SYSLMOD,
//               COND=((5,LT,COBOL),(5,LT,LKED)),
//               REGION=100K,
//               TIME=(1,0)
//*
//* SORT EIS/P&R MASTER FILE
//*
//STEPLIB    DD DSNAME=&PROJECT..LOAD,
//               VOLUME=(PRIVATE,RETAIN),
//               DISP=(SHR,PASS)
//*
//* INPUT DATA SET - EIS/P&R MASTER FILE
//*
//PNRINPUT   DD DSNAME=&PROJECT..DATA.&MSTRFIL,
//               VOLUME=(PRIVATE,RETAIN),
//               DISP=(SHR,PASS)
//*
//* OUTPUT DATA SET - SORTED FILE
//*
//PNRMASTR   DD UNIT=&UNIT,
//               VOLUME=(PRIVATE,RETAIN,SER=&SERIAL),
//               DISP=(&DISP),
//               SPACE=(&SPCUNIT,(&PRIMARY,&SECNDRY),RLSE),
//               DSNAME=&PROJECT..DATA.&SORTFIL
//*
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES
//*
//PNRPRINT   DD SYSOUT=&OUT
//*
```

```
//* SORT/MERGE DATA SETS                                                  00017500
//*                                                                       00017600
//SORTLIB   DD DSNAME=SYS1.SORTLIB,                                       00017700
//             DISP=(SHR,PASS)                                            00017800
//*                                                                       00017900
//SORTWK01  DD UNIT=&TEMP,                                                00018000
//             SPACE=(TRK,&SORTSPC,,CONTIG)                               00018100
//*                                                                       00018200
//SORTWK02  DD UNIT=(&TEMP,SEP=SORTWK01),                                 00018300
//             SPACE=(TRK,&SORTSPC,,CONTIG)                               00018400
//*                                                                       00018500
//SORTWK03  DD UNIT=(&TEMP,SEP=(SORTWK01,SORTWK02)),                      00018600
//             SPACE=(TRK,&SORTSPC,,CONTIG)                               00018700
//*                                                                       00018800
//* OUTPUT DATA SETS - SYSTEM OPERATION                                   00018900
//*                                                                       00019000
//SYSPRINT  DD SYSOUT=&OUT                                                00019100
//*                                                                       00019200
//SYSOUT    DD SYSOUT=&OUT                                                00019300
//*                                                                       00019400
//SYSDBOUT  DD SYSOUT=&OUT                                                00019500
//*                                                                       00019600
//SYSDTERM  DD SYSOUT=&OUT                                                00019700
//*                                                                       00019800
//SYSUDUMP  DD SYSOUT=&OUT                                                00019900
//*                                                                       00020000
//DELETE  EXEC PGM=IEFBR14,                                               00020100
//             REGION=4K,                                                 00020200
//             TIME=(0,5)                                                 00020300
//LOADMOD   DD DSNAME=&&LOADMOD,                                          00020400
//             DISP=(OLD,DELETE)                                          00020500
//*                                                                       00020600
```

PNRTBGEN - EMISSION FACTORS TABLE GENERATOR

PNRTBGEN is executed to generate an emission factors table. The input to the generation program consists of emission factors table transactions, defined by PNRTRANS. There are two output files used by the Generation program. The first, defined by PNREFTBL, contains the emission factors table produced by the program. The second, defined by PNRPRINT, contains diagnostic messages generated during the emission factors table generation process.


Emission Factors Table Transactions
TXTBLGEN Program
Diagnostic Messages
Emission Factors Table

PNRTBGEN - Data Flow
Figure A-14

DDNAME	Description
PNRTRANS	Emission factors table transactions
PNRPRINT	Print file for diagnostic messages
PNREFTBL	Data set to contain emission factors table.

Parameter Name	Default Value	Description
PROJECT	'SYS2.PNR'	Highest level index of data set names (e.g., SYS2.PNR.DATA.FTMSTRAA)
PROGRAM	TXTBLGEN	Program to generate emission factors table
EFTABLE	EFTABLE	Lowest level index of emission factors table
TEMP	SYSDA	Unit type for temporary work space
UNIT	2314	Unit type upon which the emission factors table is to reside
SERIAL	RTCC02	Volume serial of volume upon which emission factors table is to reside
DISP	'NEW,CATLG, DELETE'	Disposition of emission factors table
SPCUNIT	TRK	Units in which space for the emission factors table is to be allocated
PRIMARY	5	Number of units to be allocated for the emission factors table's primary allocation
SECNDRY	1	Number of units to be allocated for the emission factors table's secondary allocation
OUT	A	SYSOUT class for all print files.

PNRTBGEN - Substitutable Parameters

```
//*              PNRTBGEN                   HURLEY RF        WF4   01/31/75 00000100
//*                                                                         00000200
//PNRTBGEN PROC PROJECT='SYS2.PNR',                                         00000300
//              PROGRAM=TXTBLGEN,                                           00000400
//              EFTABLE=EFTABLE,                                            00000500
//              TEMP=SYSDA,                                                 00000600
//              UNIT=2314,                                                  00000700
//              SERIAL=RTC002,                                              00000800
//              DISP='NEW,CATLG,DELETE',                                    00000900
//              SPCUNIT=TRK,                                                00001000
//              PRIMARY=5,                                                  00001100
//              SECNDRY=1,                                                  00001200
//              OUT=A                                                       00001300
//*                                                                         00001400
//GENERATE EXEC PGM=&PROGRAM,                                               00001500
//              REGION=100K,                                                00001600
//              TIME=(1,0)                                                  00001700
//*                                                                         00001800
//* GENERATE EIS/P&P EMISSION FACTORS TABLE                                 00001900
//*                                                                         00002000
//STEPLIB   DD DSNAME=&PROJECT..LOAD,                                       00002100
//              VOLUME=(PRIVATE,RETAIN),                                    00002200
//              DISP=(SHR,PASS)                                             00002300
//*                                                                         00002400
//* INPUT DATA SET - EF TABLE TRANSACTIONS                                  00002500
//*                                                                         00002600
//PNRTRANS  DD DDNAME=INPUT,                                                00002700
//              DCB=BLKSIZE=80                                              00002800
//*                                                                         00002900
//* INPUT DATA SET - SORT PROGRAM LIBRARY                                   00003000
//*                                                                         00003100
//SORTLIB   DD DSNAME=SYS1.SORTLIB,                                         00003200
//              VOLUME=(PRIVATE,RETAIN),                                    00003300
//              DISP=(SHR,PASS)                                             00003400
//*                                                                         00003500
//* OUTPUT DATA SET - DIAGNOSTIC MESSAGES                                   00003600
//*                                                                         00003700
//PNRPRINT  DD SYSOUT=&OUT                                                  00003800
//*                                                                         00003900
//* OUTPUT DATA SET - EMISSION FACTORS' TABLE                                00004000
//*                                                                         00004100
//PNREFTBL  DD UNIT=&UNIT,                                                  00004200
//              VOLUME=(PRIVATE,RETAIN,SER=&SERIAL),                        00004300
//              DISP=(&DISP),                                               00004400
//              SPACE=(&SPCUNIT,(&PRIMARY,&SECNDRY),RLSE),                  00004500
//              DSNAME=&PROJECT..DATA.&EFTABLE                              00004600
//*                                                                         00004700
//* UTILITY DATA SETS                                                       00004800
//*                                                                         00004900
//SORTWK01  DD UNIT=&TEMP,                                                  00005000
//              SPACE=(TRK,(10,5),,CONTIG)                                  00005100
//*                                                                         00005200
//SORTWK02  DD UNIT=(&TEMP,SEP=SORTWK01),                                   00005300
//              SPACE=(TRK,(10,5),,CONTIG)                                  00005400
//*                                                                         00005500
//SORTWK03  DD UNIT=(&TEMP,SEP=(SORTWK01,SORTWK02)),                        00005600
//              SPACE=(TRK,(10,5),,CONTIG)                                  00005700
//*                                                                         00005800
//* OUTPUT DATA SETS -  SYSTEM OPERATION                              00005900
//*                                                                   00006000
//SYSPRINT  DD SYSOUT=&OUT                                            00006100
//*                                                                   00006200
//SYSOUT    DD SYSOUT=&OUT                                            00006300
//*                                                                   00006400
//SYSDBOUT  DD SYSOUT=&OUT                                            00006500
//*                                                                   00006600
//SYSDTERM  DD SYSOUT=&OUT                                            00006700
//*                                                                   00006800
//SYSUDUMP  DD SYSOUT=&OUT                                            00006900
//*                                                                   00007000
```

USE OF CATALOGED PROCEDURES

The following subsection gives an example of how to use the cataloged procedures. The sample run described in this section creates an EIS/P&R Master File, retrieves an Answer File from it, lists the Answer File and produces a summary report. These tasks can be accomplished by stringing together the proper catalogued procedures. Figure A-15 illustrates the job control cards and procedures required to perform this run.

The first step creates an EIS/P&R Master File named SYS2.PNR.DATA.FTMSTRAA. Since the file is being newly created rather than updated, the DDNAME PNROLDMS is nullified with a DD DUMMY statement to indicate that no old Master File exists. The file maintenance transactions must consist entirely of ADD transactions. After the file has been created, it is catalogued by the JCL so that it may be referred to by succeeding steps without supplying specific location information.

The second step involves the retrieval language processor to read the queries and generate a retriever program. If parameters are specified on the EXEC card, the program will be compiled using them rather than those in the procedure. An Answer File named SYS2.PNR.DATA.RTANSRAA will be produced and passed to later steps. It may be referred to by succeeding steps as if it has been cataloged. However, it will be deleted at the end of the job.

Step three invokes the file list program to list the Answer File. Figure A-16 truly reflects the results of the Detail List program.

The final step merges the COBOL break control statements with the skeleton Summary Report program and compiles it. Again, the parameters used during compilation can be overridden by the EXEC statement. The control cards defined by SUMMARY.INPUT will control the titling of the summary report.

Figure A-17 is an example of this type of report, but is not the true results of the JCL in Figure A-16.

```
//STEP1   EXEC PNRFUPDT,
//             NEWMSTR=FTMSTRAA
//UPDATE.PNROLDMS  DD DUMMY
//UPDATE.INPUT  DD *
191280067006072000                 126015FE.E.ELECTRIC                        01A
191280067006072000SHOCKING POWER COMPANY                              000000  02A
191280067006072000                                                            03A
1912800670060720000101   000000000000000             002255232474500572000    11A
19128006700607200001012807603200183000     0000     0000000000                12A
1912800670060720000142602       0600000000000000       0000000 0              13A
1912800670060720000142401       0600000000000000       0000000 3              13A
1912800670060720000111101       0090006500000000       0000000 3              13A
1912800670060720000142101       0600000000000000       0000000 0              13A
1912800670060720000143101       0600000000000000       0000000 0              13A
191280067006072000010520200201      0069320       31510500023                 21A
19128006700607200001052B                         A                            22A
1912800670060720000105424010002000000SU11101000100000SU42101000500000SU       23A
191280067006072000010543101000400000SU42602000300000SU                        23A
191280067006072000011020200601      0001354       63400000999                 21A
19128006700607200001102B                         A                            22A
191280067006072000011011101000100000SU42101000500000SU43101000400000SU        23A
191280067006072000011042602000300000SU42401000200000SU                        23A
//STEP2   EXEC PNRRETVR
//COMPILE.INPUT  DD *
$$SELECT
STATE                             = '19'                            AND
COUNTY                            = '1280'                          AND
AQCR                              = '067'                           AND
PLANT-ID                          = '0060'                          AND
NEDS-POINT-ID                     = '01'                            AND
(SCC                              = '20200201'                      OR
SCC                               = '20200601')
$$END
//STEP3   EXEC PNRPREPT,
//             MSTRFIL=RTANSRAA
```

Sample EIS/P&R Job Stream
Figure A-15

```
//STEP4   EXEC PNRBREPT,
//             MSTRFIL=RTANSRAA
//COMPILE.INPUT  DD *
          MOVE MSTR-POLLUTION-ID (EM-SET-INDEX) TO BREAK-ONE.
//SUMMARY.INPUT  DD *
OP1  EIS SUMMARY DEMONSTRATION        SUM BY POLLUTION                03/06/73
OP2  EIS DEVELOPMENT GROUP,IBM        MR. LLOYD HEDGEPETH,EPA
OP3
OP4  POLL.   ID
```

Sample EIS/P&R Job Stream
Figure A-15 (Continued)

```
STATE COUNTY AQCR PLANT ID
  19    1260   067   0060

  DATE     SEGMENT  CONTROL  LOCAL
YEAR DAY     ID      REGION   CONTROL    PLANT ID     CITY UTM ZONE OWNER      CONTACT          TELEPHONE     PRINCIPAL
 72  000     000                                      1260    15       F   E.E.ELECTRIC                       PRODUCT

ESTABLISHMENT NAME AND ADDRESS                ZIP    NUMBER OF  PROPERTY
[illegible]                                          EMPLOYEES    AREA      MAILING ADDRESS                                    ZIP
                                                                [illegible]

  DATE   SEGMENT POINT ID                          UTM COORDINATES     LATITUDE       LONGITUDE     ANNUAL THRUPUT    NORMAL OPERATING
YEAR DAY   ID    NEDS USER   SIC  IPP HORIZONTAL VERTICAL DEG MIN SEC DEG MIN SEC DEC MAR JUN SEP  HR/D D/WK WK/YR
 72  000  101     01             0000 00    000.0     0000.0                             00  22  55  23   24    7    45

BOILER    SPACE  S     T     A     C     K          D    A    T    A        COMP SCHED    COMP STATUS            CONTROL REGULATION
CAPACITY  HEAT    HEIGHT DIAM TEMP FLOW RATE VELOCITY PLUME PNTS  COMP YEAR MONTH   YEAR MONTH DAY  ECAP REG 1 REG 2 REG 3
 00572    00.0    0128  07.6 0320  0183000            0000              00    00      00    00    00

NUMBER OF    POLLUTANT CONTROL   CONTROL EQUIP  ESTM CNTL            E M I S S I O N S                  ESTIMATE   TEST
POLLUTANTS      ID      COST      PRI   SEC     EFFICIENCY  ESTIMATE MEASURED ALLOWABLE UNITS   METHOD    METHOD
    05        42602             [illegible]       00.0     [illegible]       0000000              0
              42401               060   000       00.0      0022694          0000000              3
              11101               009   000       65.0      0003971          0000000              3
              42101             [illegible]       00.0     [illegible]       0000000              0
              43101               060   000       00.0      0000000          0000000              0

  DATE   SEGMENT          SCC         SIC                  FUEL -   MAX DESIGN  SULFUR    ASH      HEAT
YEAR DAY    ID      I II III IV NBR ID  UNITS PROCESS       RATE      CONTENT CONTENT  CONTENT CONF SOURCE
 72  000 2 01 05 2 02 002 01                 0069320                  3.15     10.5     00023    2    B

SOURCE DESCRIPTION             E F    NUMBER OF  POLLUTANT EMISSION     ASH /   FACTOR
                              SOURCE  EMSN FCTR     ID       FACTOR     SULFUR  UNITS
                                4        05       42401    000200.000     S       U
                                                  11101    000100.000     S       U
                                                  42101    000500.000     S       U
                                                  43101    000400.000     S       U
                                                  42602    000300.000     S       U

  DATE   SEGMENT          SCC         SIC                  FUEL -   MAX DESIGN  SULFUR    ASH      HEAT
YEAR DAY    ID      I II III IV NBR ID  UNITS PROCESS       RATE      CONTENT CONTENT  CONTENT CONF SOURCE
 72  000 2 01 10 2 02 006 01                 0001354                  6.34     00.0     00999    2    B

SOURCE DESCRIPTION             E F    NUMBER OF  POLLUTANT EMISSION     ASH /   FACTOR
                              SOURCE  EMSN FCTR     ID       FACTOR     SULFUR  UNITS
                                4        05       11101    000100.000     S       U
                                                  42101    000500.000     S       U
                                                  43101    000400.000     S       U
                                                  42602    000300.000     S       U
                                                  42401    000200.000     S       U
```

Sample Detail List
Figure A-16

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```
                                                 AIR POLLUTANT EMISSIONS SUMMARY                                   03/06/73
      EIS SUMMARY DEMONSTRATION
      SUM BY POLLUTION                                                         FROM  EIS DEVELOPMENT GROUP,IBM
                                                                               FOR   MR. LLOYD HEDGEPETH,EPA

BREAK     BREAK     BREAK     BREAK     POLL.                NUMBER   ESTIMATES      ACTUAL       ALLOWABLE    CONTROL
FIVE      FOUR      THREE     TWO       ID                   SOURCES  EMISSIONS      EMISSIONS    EMISSIONS    EQUIPMENT COST

                                        42401          *        58    4,414,643              0       20,000              $.00

                                        42602          *        58    3,020,356         20,202       87,500              $.00

                                        43101          *        58      381,518              0      400,000              $.00

                                                      **       174    7,816,517         20,202      507,500              $.00

                                                     ***       174    7,816,517         20,202      507,500              $.00

                                                    ****       174    7,816,517         20,202      507,500              $.00

                                                   *****       174    7,816,517         20,202      507,500              $.00

                                                   TOTAL                                                                 $.00

                                                                                                              PAGE    1
```

Sample Summary Report
Figure A-17.

Appendix B - Sample Runs

This appendix presents sample system runs. In the samples the transactions, files, and tables are represented as residing on disk, tape, and card and are shown changing media during and between runs. This is not a system requirement but is merely to indicate the flexibility of external data storage. The following is not an exhaustive list of possible system program combinations but is a sample of possible uses. A sample job stream follows each flow diagram.

Figure B-1 shows a system start up run. There are no existing files for the Emission Factor Table or the Master File. The first step is to create an Emission Factor Table using program TXTBLGEN. The table can then be used to insert the new Emission Factors into EIS/P&R transactions. The NEDS Point Source Transactions are run through program CXNEDSCV to convert them to the EIS/P&R input transaction format. The NEDS transaction cards are then put into a hold file.

The new EIS/P&R transactions can now be used as input to program KXEMFINS which will use the Emission Factor Table to insert the emission factors into the transactions. These updated EIS/P&R transactions can then be used to create a Master File using program FXFILMNT. Notice that there is no old Master File being used in this run.

Figure B-2 shows the conversion of NEDS Area Source Transactions into EIS/P&R transactions using program DXNEDSAS. The EIS/P&R transactions are then run through program KXEMFINS. In this run, since the Emission Factor Table already exists, we use it to insert the emission factors into the EIS/P&R transactions.

The new transactions are now used to update the existing Master File using FXFILMNT. The old Master File should be kept until the next update has been run. This will provide a backup file in case anything happens to the current Master File. At this point, the Master File may be listed using program PXFILPRT. The formatted listing provides a further backup for the file. The entire file should be listed periodically to provide current file status checks.

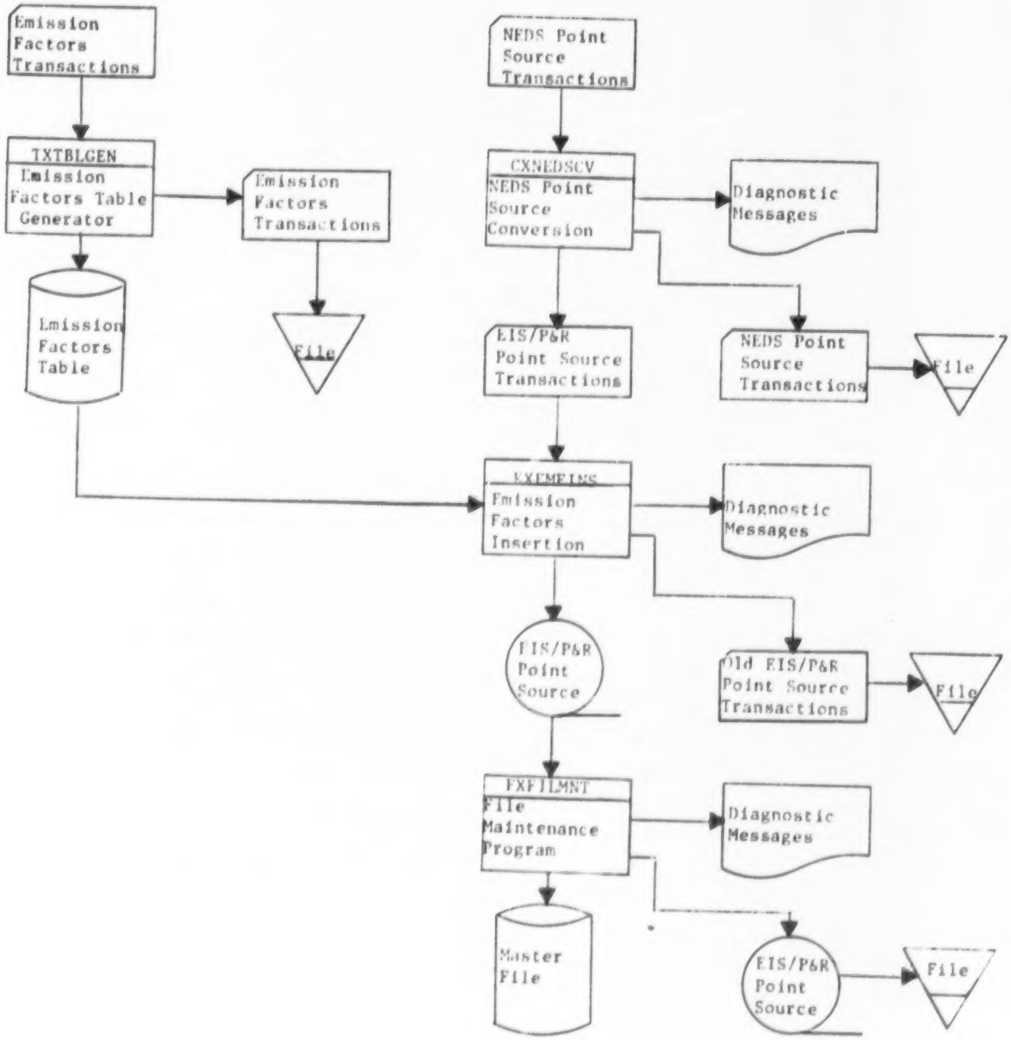
Figure B-3 shows the Retrieval program package being used to select the area source records from the Master File. The File Print Program PXFILPRT is used to print a formatted listing of the answer file. The program AXASNEDS uses the answer file and produces the NEDS Area Source Cards. The area source cards may be listed using program HXANREPT which produces a formatted list of the NEDS formats.

Figure B-4 shows the Retrieval program package being used to select the point source records from the Master File. The Answer File from this retrieval is then listed using program PXFILPRT. The answer set is then used as input to program NXNEDSCV which converts it to NEDS point source cards. The NEDS cards can then be used to file the quarterly NEDS report.

Figure B-5 shows the Retrieval program package being used to select a set of data based on the requirements of the request cards. A formatted detail listing of the answer set is produced by program PXFILPRT. The information in the answer set is summarized by program BXSUMARY to produce the EIS/P&R Summary Report.

Figure B-6 shows the Emission Factors Transaction Generation program, EXTRNGEN, used to generate transactions using both the Master File and the emission factors as found in the Emission Factors Table. These generated transactions, along with any manually prepared transactions, are then processed by the Transaction Sorter, IXTRNSRT, to put them in the proper sequence necessary for processing by FXFILMNT, the File Maintenance program. This new Master File is then sorted into a user-specified sequence using the Master File Sorter package to produce an Answer File from which a detailed list of this sorted file is produced by program PXFILPRT.

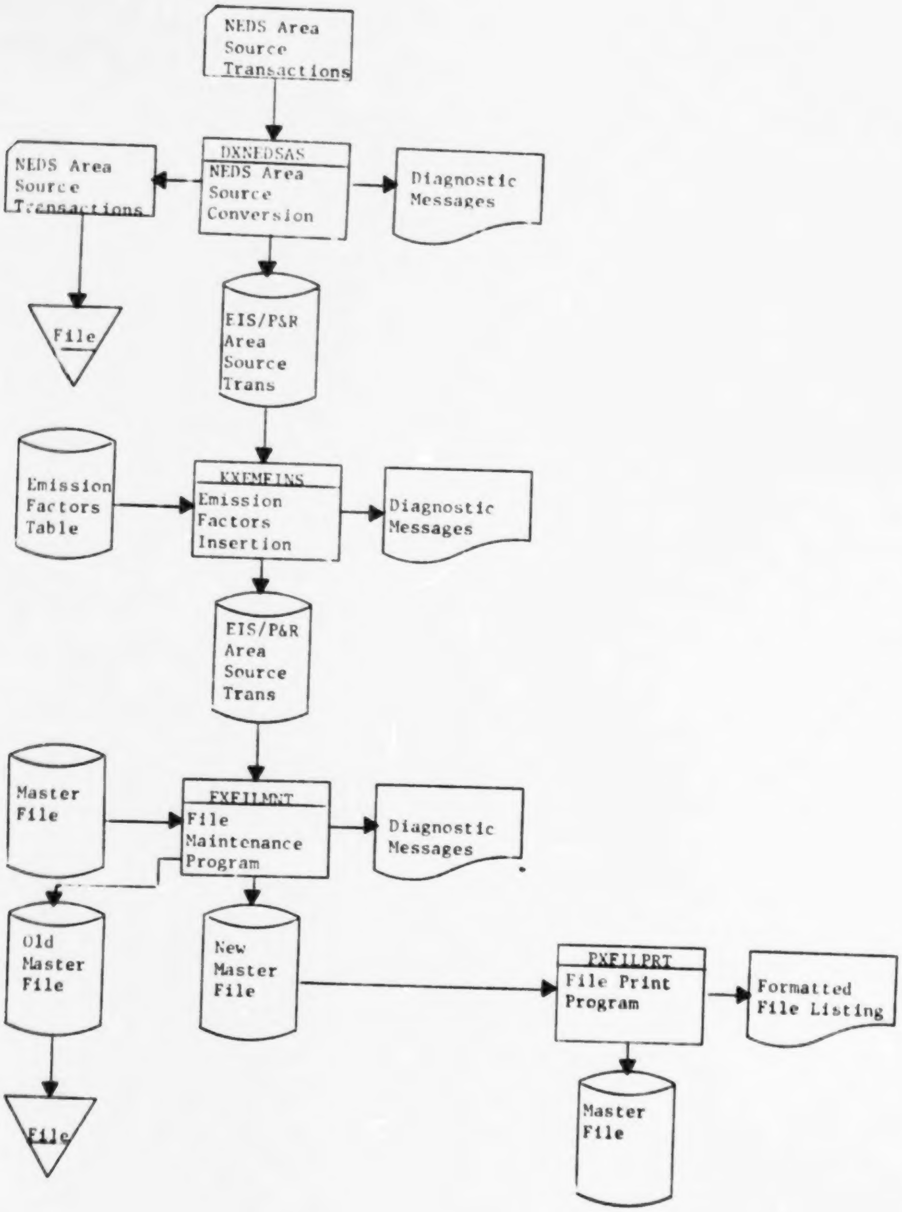
Figures B-7 through B-10 are the EIS/P&R forms for the point source data.


Emission Factors Transactions
TXTBLGEN
Emission Factors Table Generator
Emission Factors Transactions
Emission Factors Table
File
NEDS Point Source Transactions
CXNEDSCV
NEDS Point Source Conversion
Diagnostic Messages
EIS/P&R Point Source Transactions
NEDS Point Source Transactions
File
EXEMFINS
Emission Factors Insertion
Diagnostic Messages
EIS/P&R Point Source
Old EIS/P&R Point Source Transactions
File
EXFILMNT
File Maintenance Program
Diagnostic Messages
Master File
EIS/P&R Point Source
File

Sample Run 1
Figure B-1

```
//STEP1   EXEC PNRTBGEN
//GENERATE.INPUT  DD *
 Emission Factors Table Transactions
//STEP2   EXEC PNRCNVRT
//CONVERT.INPUT  DD *
 NEDS Point Source Cards
//CONVERT.OUTPUT  DD UNIT=SYSDA,
//             DISP=(NEW,PASS),
//             SPACE=(TRK,(10,5),RLSE),
//             DSNAME=&&NEDS
//STEP3   EXEC PNRKEFIN
//INSERT.INPUT  DD DSNAME=&&NEDS,
//             DISP=(OLD,DELETE)
//INSERT.OUTPUT  DD UNIT=SYSDA,
//             DISP=(NEW,PASS),
//             SPACE=(TRK,(10,5),RLSE),
//             DSNAME=&&TRANS
//STEP4   EXEC PNRFUPDT,
//             NEWMSTR=FTMSTRAA
//UPDATE.PNROLDMS  DD DUMMY
//UPDATE.INPUT  DD DSNAME=&&TRANS,
//             DISP=(OLD,DELETE)
```

Figure B-1.1
Sample Job Stream

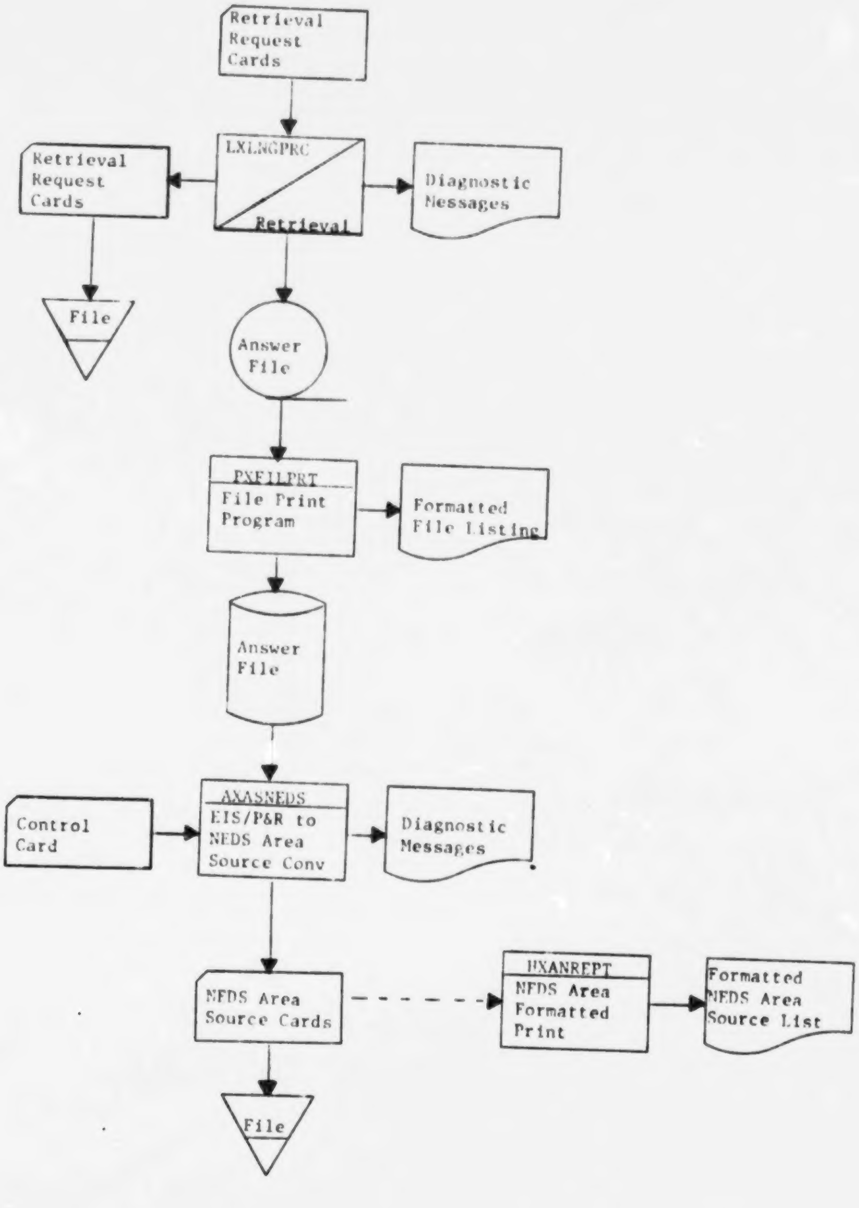

NEDS Area Source Transactions
DXNEDSAS
NEDS Area Source Conversion
NEDS Area Source Transactions
Diagnostic Messages
File
EIS/P&R Area Source Trans
Emission Factors Table
KXEMFINS
Emission Factors Insertion
Diagnostic Messages
EIS/P&R Area Source Trans
Master File
FXFILMNT
File Maintenance Program
Diagnostic Messages
Old Master File
New Master File
PXFILPRT
File Print Program
Formatted File Listing
File
Master File

Sample Run 2
Figure B-2

```
//STEP1   EXEC PNRDCONV
//CONVERT.PNRTRANS  DD UNIT=SYSDA,
//             DISP=(NEW,PASS),
//             SPACE=(TRK,(10,5),RLSE),
//             DSNAME=&&NEDS
//STEP2   EXEC PNRKEFIN
//INSERT.INPUT  DD DSNAME=&&NEDS,
//             DISP=(OLD,DELETE)
//INSERT.OUTPUT  DD UNIT=SYSDA,
//             DISP=(NEW,PASS),
//             SPACE=(TRK,(10,5),RLSE),
//             DSNAME=&&TRANS
//STEP3   EXEC PNRFUPDT
//UPDATE.INPUT  DD DSNAME=&&TRANS,
//             DISP=(OLD,DELETE)
```

Figure B-2.1

Sample Job Stream

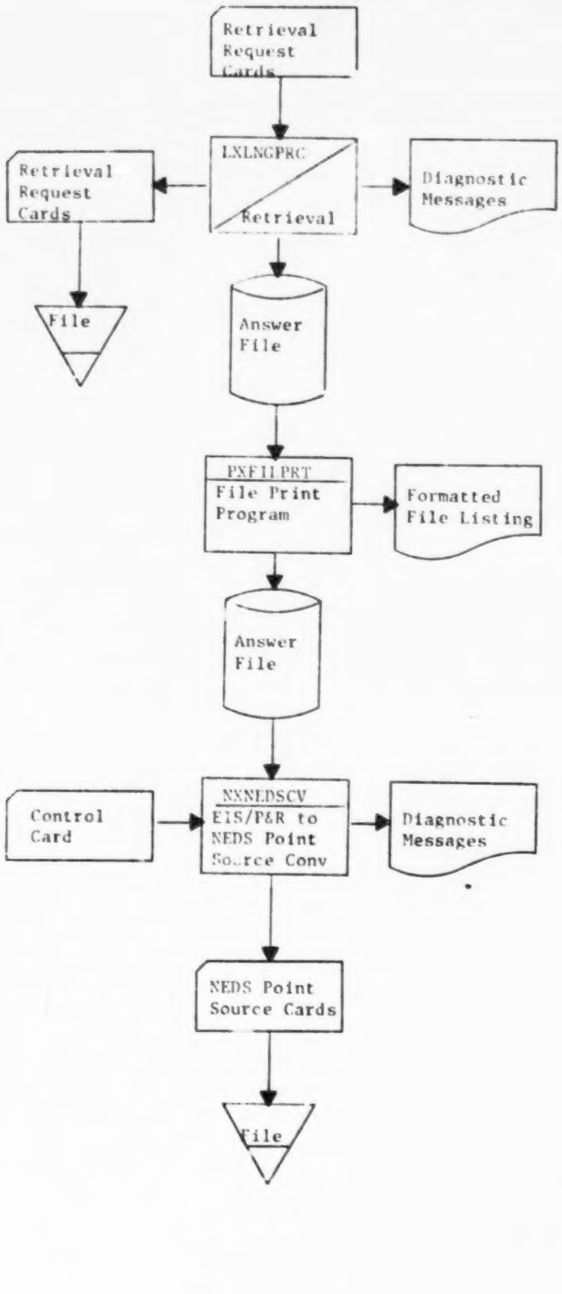

Retrieval Request Cards
LXLNGPRC
Retrieval
Retrieval Request Cards
Diagnostic Messages
File
Answer File
PXFILPRT
File Print Program
Formatted File Listing
Answer File
AXASNEDS
EIS/P&R to NEDS Area Source Conv
Control Card
Diagnostic Messages
NEDS Area Source Cards
HXANREPT
NEDS Area Formatted Print
Formatted NEDS Area Source List
File

Sample Run 3
Figure B-3

```
//STEP1   EXEC PNRRETVR
//COMPILE.INPUT  DD *
$$SELECT
USER-PLANT-ID                          = 'AREA SOURCE'
$$END
//STEP2   EXEC PNRPREPT,
//             MSTRFIL=RTANSRAA
//STEP3   EXEC PNRANCNV,
//             MSTRFIL=RTANSRAA
//CONVERT.INPUT DD *
A
.
.
.
//STEP1   EXEC PNRHREPT
//REPORT.PNRNEDS  DD *
 NEDS Area Source Cards Punched By Preceding Job
```

Figure B-3.1

Sample Job Stream

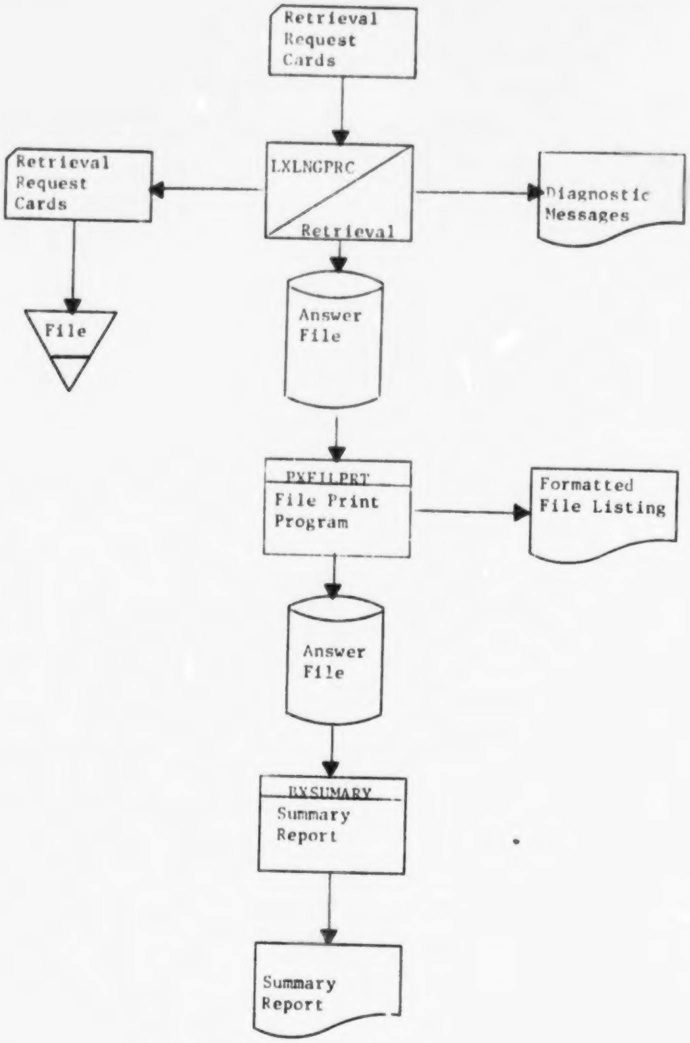

Retrieval Request Cards
LXLNGPRC
Retrieval
Retrieval Request Cards
Diagnostic Messages
File
Answer File
PXFILPRT
File Print Program
Formatted File Listing
Answer File
Control Card
NXNEDSCV
EIS/P&R to NEDS Point Source Conv
Diagnostic Messages
NEDS Point Source Cards
File

Sample Run 4
Figure B-4

```
//STEP1   EXEC PNRRETVR
//COMPILE.INPUT  DD *
$$SELECT
USER-PLANT-ID                          N = 'AREA SOURCE'
$$END
//STEP2   EXEC PNRPREPT,
//              MSTRFIL=RTANSRAA
//STEP3   EXEC PNRNCONV,
//              MSTRFIL=RTANSRAA
//CONVERT.INPUT  DD *
A
```

Figure B-4.1

Sample Job Stream

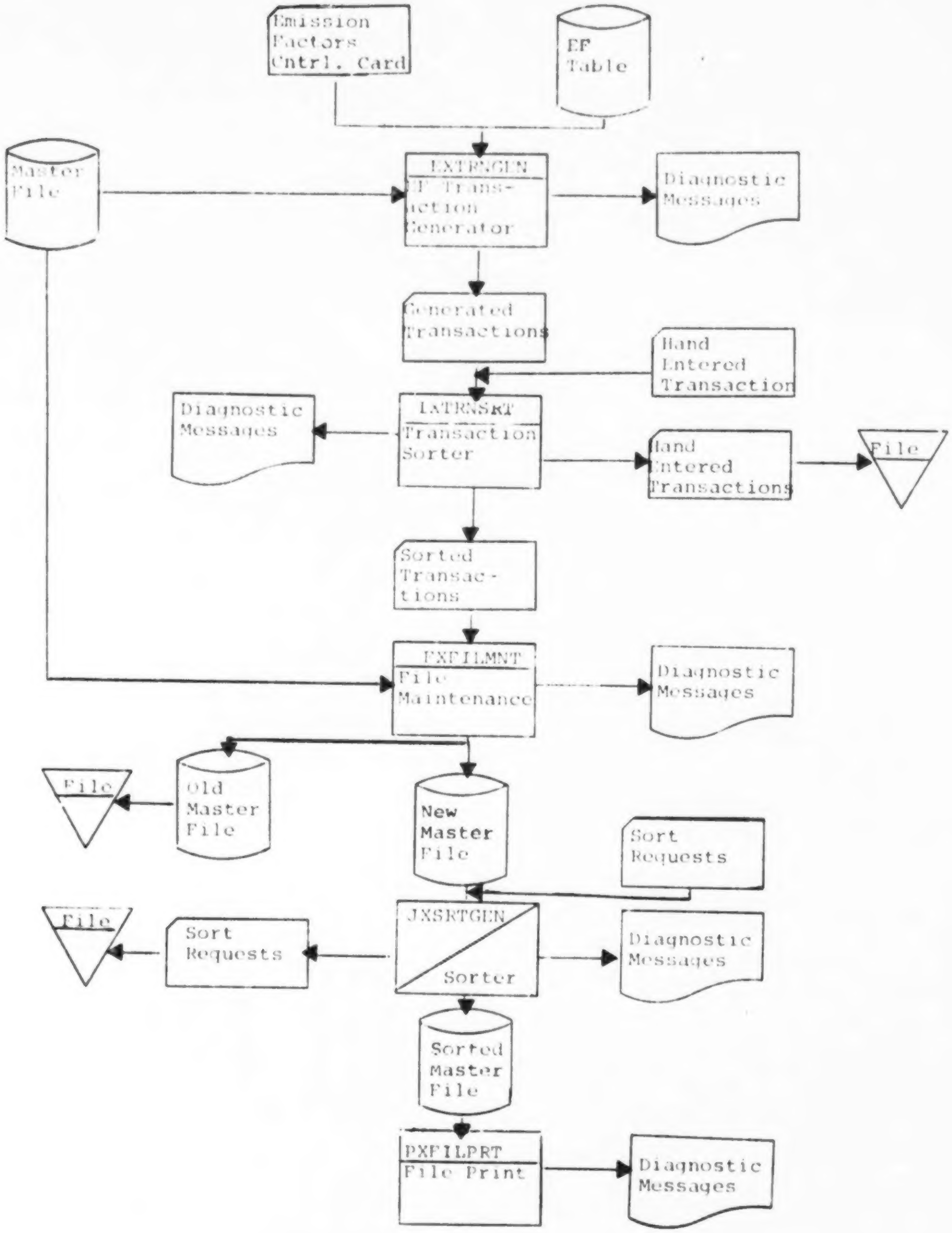

Retrieval
Request
Cards
LXLNGPRC
Retrieval
Retrieval
Request
Cards
Diagnostic
Messages
File
Answer
File
PXFILPRT
File Print
Program
Formatted
File Listing
Answer
File
RXSUMARY
Summary
Report
Summary
Report

Sample Run 5
Figure B-5

```
//STEP1   EXEC PNRRETVR
//COMPILE.INPUT  DD *
$$SELECT
 Retrieval Specifications
$$END
//STEP2   EXEC PNRPREPT,
//              MSTRFIL=RTANSRAA
//STEP3   EXEC PNRBREPT,
//              MSTRFIL=RTANSRAA
//COMPILE.INPUT  DD *
 MOVE Statements
//SUMMARY.INPUT  DD *
 OP Control Cards
```

Figure B-5.1

Sample Job Stream

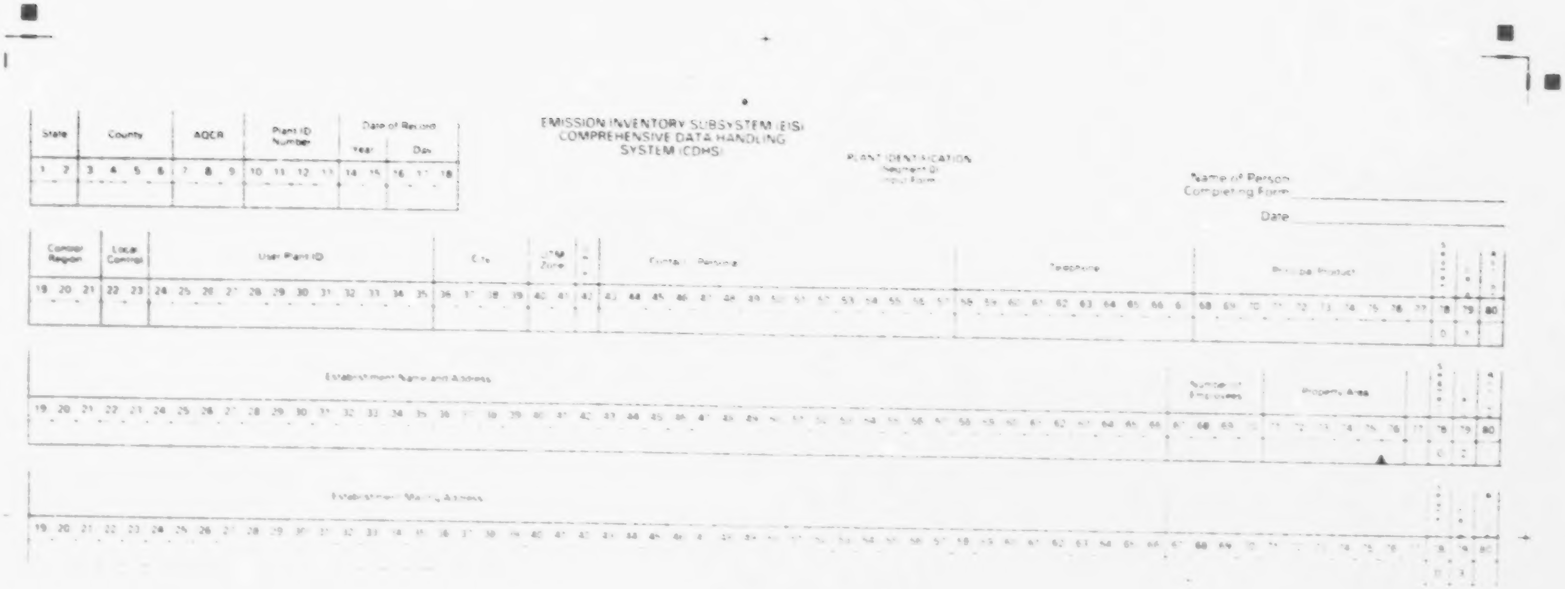

Emission Factors Cntrl. Card
EF Table
Master File
EXTRNGEN
EF Trans-action Generator
Diagnostic Messages
Generated Transactions
Hand Entered Transaction
EXTRNSRT
Transaction Sorter
Diagnostic Messages
Hand Entered Transactions
File
Sorted Transac-tions
PXFILMNT
File Maintenance
Diagnostic Messages
File
Old Master File
New Master File
Sort Requests
JXSRTGEN
Sorter
File
Sort Requests
Diagnostic Messages
Sorted Master File
PXFILPRT
File Print
Diagnostic Messages

Sample Run 6
Figure B-6

```
//STEP1   EXEC PNREFUPD
//EFUPDATE.INPUT  DD *
74000 X
//STEP2   EXEC PNRISORT
//SORT.PNRINPUT  DD *
 Hand Entered EIS/P&R Transactions
//          DD DSNAME=SYS2.PNR.DATA.TRANS,
//             DISP=(OLD,DELETE)
//SORT.OUTPUT  DD UNIT=SYSDA,
//             DISP=(NEW,PASS),
//             SPACE=(TRK,(10,5),RLSE),
/              DSNAME=&&TRANS
//STEP3   EXEC PNRFUPDT
//UPDATE.INPUT  DD DSNAME=&&TRANS,
//             DISP=(OLD,DELETE)
//STEP4   EXEC PNRSORTR,
//             MSTRFIL=FTMSTRAB
//COMPILE.INPUT  DD *
$$SORT
 Sort Specifications
$$END
//STEP5   EXEC PNRPREPT,
//             MSTRFIL=STSORTAA
```

Figure B-6.1

Sample Job Stream



EMISSION INVENTORY SUBSYSTEM (EIS)
COMPREHENSIVE DATA HANDLING
SYSTEM (CDHS)

PLANT IDENTIFICATION
Segment 0
Input Form

Name of Person
Completing Form ____________

Date ____________

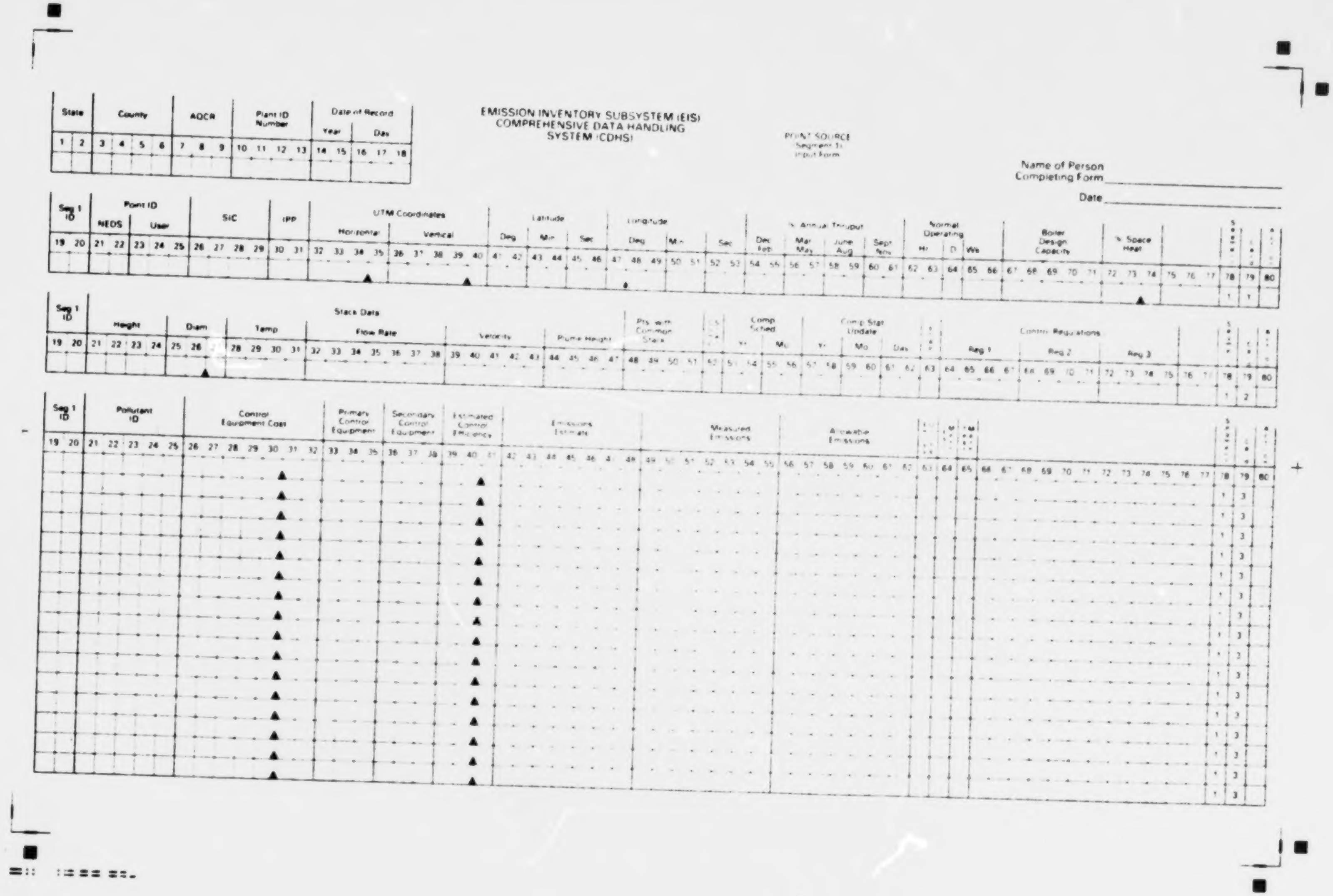
State	County	AQCR	Plant ID Number	Date of Record Year	Date of Record Day
1 2	3 4 5 6	7 8 9	10 11 12 13	14 15	16 17 18

Control Region	Local Control	User Plant ID	City	UTM Zone		Contact Personnel	Telephone	Principal Product			
19 20 21	22 23	24 25 26 27 28 29 30 31 32 33 34 35	36 37 38 39	40 41	42	43 44 45 46 47 48 49 50 51 52 53 54 55 56 57	58 59 60 61 62 63 64 65 66 67	68 69 70 71 72 73 74 75 76 77	78	79	80
									0	1	

Establishment Name and Address	Number of Employees	Property Area				
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66	67 68 69 70	71 72 73 74 75 76	77	78	79	80
				0	2	

Establishment Mailing Address			
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77	78	79	80
	0	3	

Segment 0 Input Forms
Figure B-7



EMISSION INVENTORY SUBSYSTEM (EIS)
COMPREHENSIVE DATA HANDLING
SYSTEM (CDHS)

POINT SOURCE
Segment 1)
Input Form

Name of Person Completing Form ____________________

Date ____________________

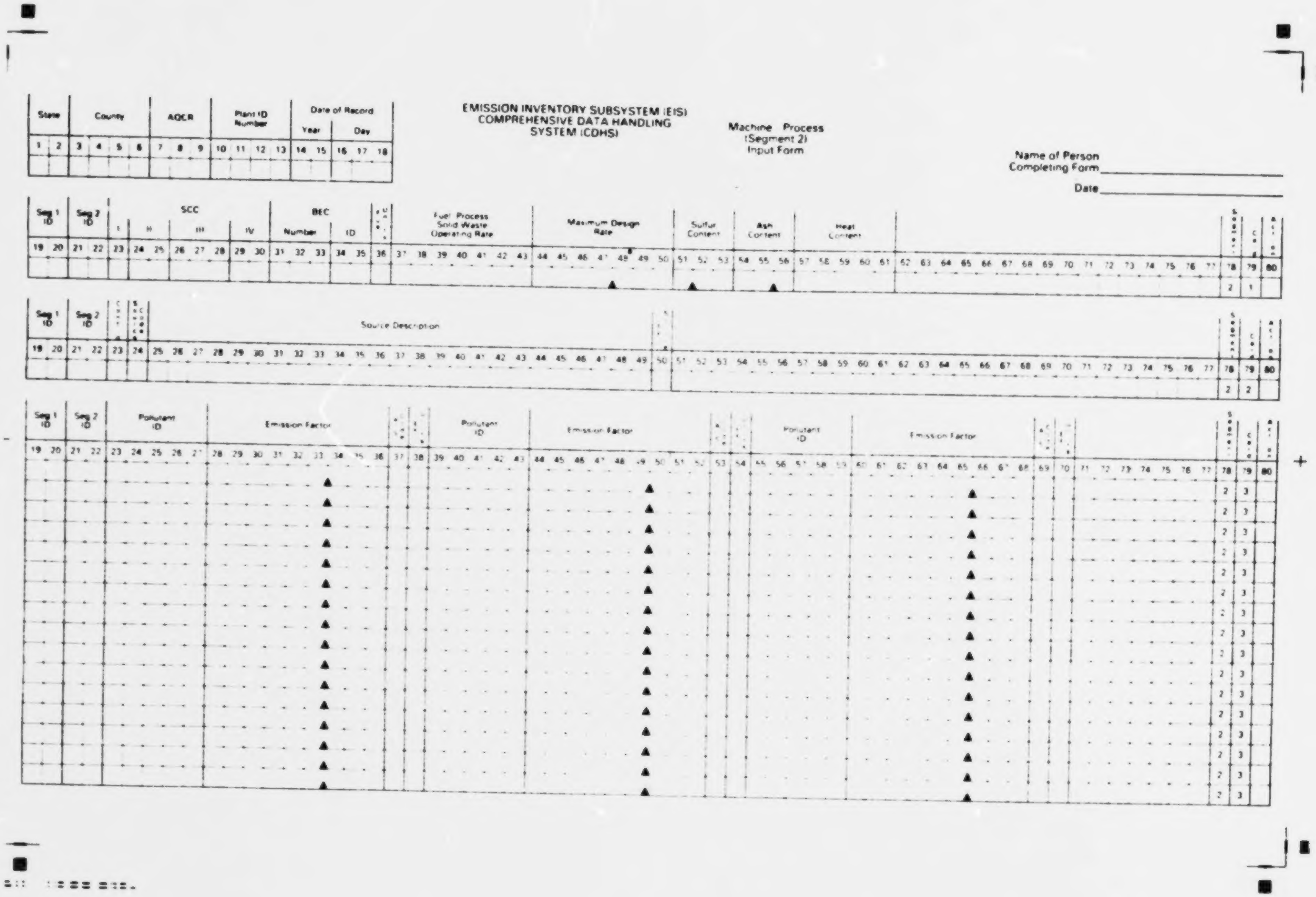
State	County	AQCR	Plant ID Number	Date of Record Year	Date of Record Day
1 2	3 4 5 6	7 8 9	10 11 12 13	14 15	16 17 18

Seg 1 ID	Point ID NEDS	Point ID User	SIC	IPP	UTM Coordinates Horizontal	UTM Coordinates Vertical	Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	% Annual Thruput Dec Feb	Mar May	June Aug	Sept Nov	Normal Operating Hr	D	Wk	Boiler Design Capacity	% Space Heat				
19 20	21 22	23 24 25	26 27 28 29	30 31	32 33 34 35	36 37 38 39 40	41 42	43 44	45 46	47 48 49	50 51	52 53	54 55	56 57	58 59	60 61	62 63	64	65 66	67 68 69 70 71	72 73 74	75 76 77	78	79	80
																							1	1	

Seg 1 ID	Stack Data Height	Diam	Temp	Flow Rate	Velocity	Plume Height	Pts with Common Stack		Comp Sched Yr	Comp Sched Mo	Comp Stat Update Yr	Comp Stat Update Mo	Comp Stat Update Day		Control Regulations Reg 1	Reg 2	Reg 3				
19 20	21 22 23 24	25 26 27	28 29 30 31	32 33 34 35 36 37 38	39 40 41 42 43	44 45 46 47	48 49 50 51	52	53 54	55 56	57 58	59 60	61 62	63	64 65 66 67	68 69 70 71	72 73 74 75	76 77	78	79	80
																			1	2	

Seg 1 ID	Pollutant ID	Control Equipment Cost	Primary Control Equipment	Secondary Control Equipment	Estimated Control Efficiency	Emissions Estimate	Measured Emissions	Allowable Emissions							
19 20	21 22 23 24 25	26 27 28 29 30 31 32	33 34 35	36 37 38	39 40 41	42 43 44 45 46 47 48	49 50 51 52 53 54 55	56 57 58 59 60 61 62	63	64	65	66 67 68 69 70 71 72 73 74 75 76 77	78	79	80
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	
													1	3	

Segment 1 Input Forms
Figure B-8



State		County				AQCR			Plant ID Number				Date of Record Year		Day		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

EMISSION INVENTORY SUBSYSTEM (EIS)
COMPREHENSIVE DATA HANDLING
SYSTEM (CDHS)

Machine Process
(Segment 2)
Input Form

Name of Person
Completing Form ____________________

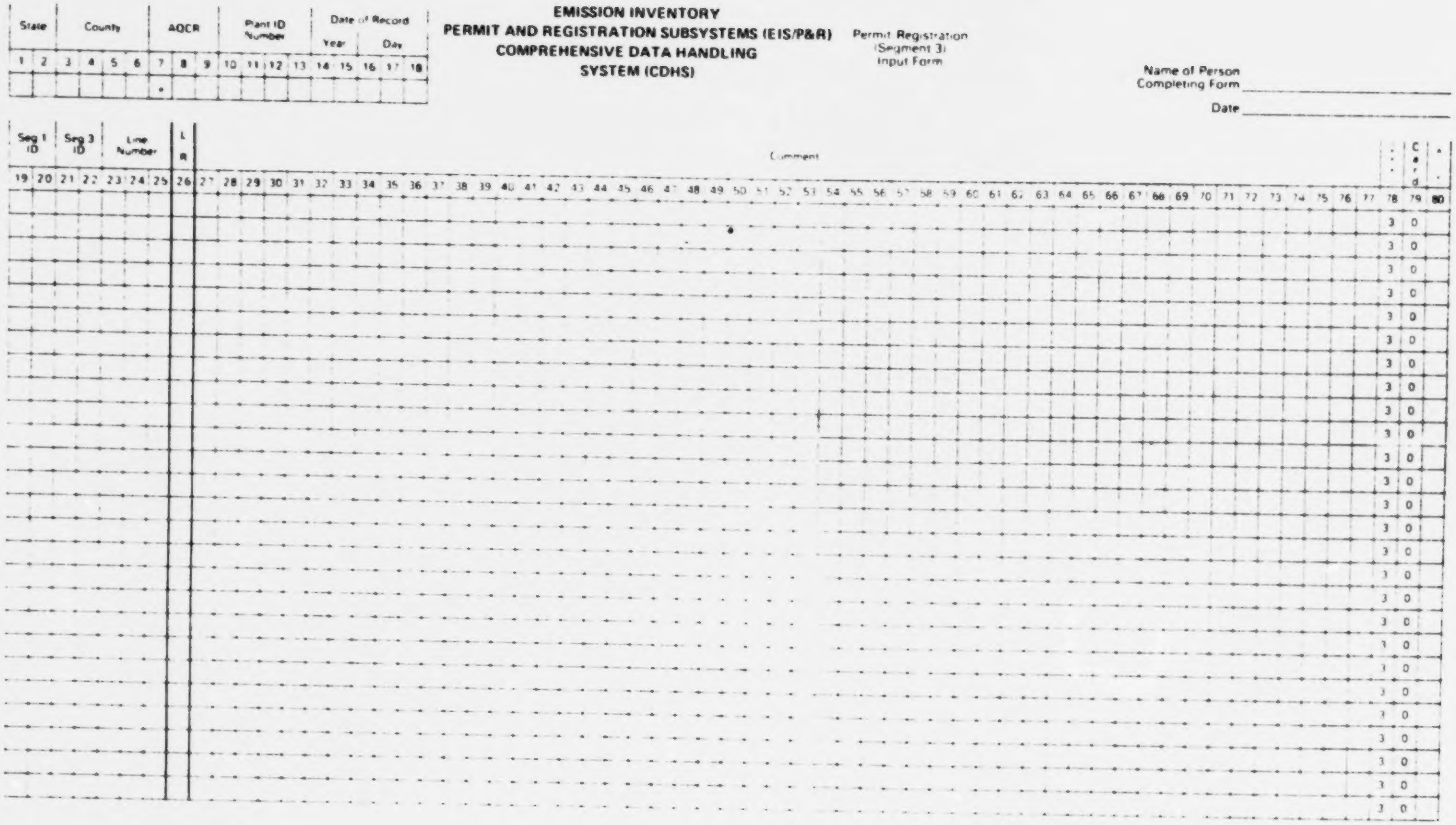
Date ____________________

Seg 1 ID	Seg 2 ID	SCC I	SCC II	SCC III	SCC IV	BEC Number	BEC ID		Fuel Process Solid Waste Operating Rate	Maximum Design Rate	Sulfur Content	Ash Content	Heat Content				
19 20	21 22	23	24 25	26 27 28	29 30	31 32 33	34 35	36	37 38 39 40 41 42 43	44 45 46 47 48 49 50	51 52 53	54 55 56	57 58 59 60 61	62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77	78	79	80
															2	1	

Seg 1 ID	Seg 2 ID			Source Description					
19 20	21 22	23	24	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	50	51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77	78	79	80
							2	2	

Seg 1 ID	Seg 2 ID	Pollutant ID	Emission Factor			Pollutant ID	Emission Factor			Pollutant ID	Emission Factor						
19 20	21 22	23 24 25 26 27	28 29 30 31 32 33 34 35 36	37	38	39 40 41 42 43	44 45 46 47 48 49 50 51 52	53	54	55 56 57 58 59	60 61 62 63 64 65 66 67 68	69	70	71 72 73 74 75 76 77	78	79	80
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	
															2	3	

Segment 2 Input Forms
Figure B-9



State		County				AQCR			Plant ID Number				Date of Record Year		Date of Record Day		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
						.											

EMISSION INVENTORY
PERMIT AND REGISTRATION SUBSYSTEMS (EIS/P&R)
COMPREHENSIVE DATA HANDLING
SYSTEM (CDHS)

Permit Registration
(Segment 3)
Input Form

Name of Person Completing Form ____________

Date ____________

Seg 1 ID	Seg 3 ID	Line Number	L R	Comment	Card	
19 20	21 22	23 24 25	26	27 – 77	78 79	80
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	
					3 0	

Segment 3 Input Forms
Figure B-10

Appendix C - Program Modification

Page

Increasing Number of Pollutants

Emission Factors Table Generator 388
Emission Factors Transaction Generator 389
File Maintenance 391
Retriever 393
Master File Sorter 396
File List Output 399
Summary Report Output 400
NEDS Point Source Output 401
NEDS Area Source Output 402

Increasing Number of Machine Process Segments

Emission Factors Transaction Generator 404
File Maintenance 404
Retriever 405
Master File Sorter 405

INCREASING NUMBER OF POLLUTANTS

Whenever it is desired to change the maximum number of pollutants to be handled by EIS/P&R, it is necessary to modify the following programs:

Emission Factors Table Generator
Emission Factors Transaction Generator
File Maintenance
Retriever
Master File Sorter
File List Output
Summary Report Output
NEDS Point Source Output
NEDS Area Source Output

The current limit for the maximum number of pollutants handled by EIS/P&R is 16.

The following paragraphs discuss the changes to be made in each program described above.

- Emission Factors Table Generator

  Change the VALUE clause of the following sentence:

  ```
  02  LIT-16                       PIC 9(5) COMP SYNC VALUE 16.
  ```

  on or about sequence number 00013400, from 16 to the new maximum number of pollutants. For example:

  ```
  02  LIT-16                       PIC 9(5) COMP SYNC VALUE 18.
  ```

  will increase the maximum to 18 pollutants.

- **Emission Factors Transaction Generator**

  Change the OCCURS clause of the following phrase:

  ```
  02  OLD-MAST-RPT1             OCCURS 1 TO 16 TIMES
  ```

  on or about sequence number 00008800, from 16 to the new maximum number of pollutants. For example:

  ```
  02  OLD-MAST-RPT1             OCCURS 1 TO 18 TIMES
  ```

  will increase the maximum to 18 pollutants.

  Change the OCCURS clause of the following phrase:

  ```
  02  OLD-MAST-RPT2             OCCURS 1 TO 16 TIMES
  ```

  on or about sequence number 00009600, from 16 to the new maximum number of pollutants. For example:

  ```
  02  OLD-MAST-RPT2             OCCURS 1 TO 18 TIMES
  ```

  will increase the maximum to 18 pollutants.

  Change the OCCURS clause of the following phrase:

  ```
  02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
  ```

  on or about sequence number 00049100, from 16 to the new maximum number of pollutants. For example:

  ```
  02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
  ```

  will increase the maximum to 18 pollutants.

  Change the OCCURS clause of the following phrase:

  ```
  02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
  ```

  on or about sequence number 00050900, from 16 to the new maximum number of pollutants. For example:

  ```
  02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
  ```

  will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 16 TIMES
```

on or about sequence number 00055400, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 16 TIMES
```

on or about sequence number 00056400, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the PICTURE clause of the following sentence:

```
    03  EF-VALUES              PIC X (256).
```

on or about sequence number 00058600, from 256 to a value equal to 16 times the new maximum number of pollutants. For example:

```
    03  EF-VALUES              PIC X(288).
```

will increase the maximum to 18 pollutants.

Change the value of the literal in the following clause:

```
IF POLID-INDEX-A < 17
```

on or about sequence number 00083900, from 17 to a value equal to the new maximum number of pollutants plus one. For example:

```
IF POLID-INDEX-A < 19
```

will increase the maximum to 18 pollutants.

- **File Maintenance**

Change the OCCURS clause of the following phrase:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
```

on or about sequence number 00013000, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00014800, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 16 TIMES
```

on or about sequence number 00019500, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 16 TIMES
```

on or about sequence number 00020500, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  OLD-MAST-RPT1             OCCURS 1 TO 16 TIMES
```

on or about sequence number 00023900, from 16 to the new maximum number of pollutants. For example:

```
02  OLD-MAST-RPT1             OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  OLD-MAST-RPT2             OCCURS 1 TO 16 TIMES
```

on or about sequence number 00024700, from 16 to the new maximum number of pollutants. For example:

```
02  OLD-MAST-RPT2             OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the VALUE clause of the following sentence:

```
77  MAX-CARD2                 PIC 99 COMP SYNC VALUE 16.
```

on or about sequence number 00046200, from 16 to the new maximum number of pollutants. For example:

```
77  MAX-CARD2                 PIC 99 COMP SYNC VALUE 18.
```

will increase the maximum to 18 pollutants.

Change the VALUE clause of the following sentence:

```
77  MAX-CARD1                 PIC 99 COMP SYNC VALUE 16.
```

on or about sequence number 00046300, from 16 to the new maximum number of pollutants. For example:

```
77  MAX-CARD1                 PIC 99 COMP SYNC VALUE 18.
```

will increase the maximum to 18 pollutants.

Change the PICTURE clause of the following sentence:

```
    03  FILLER                 PIC X(325).
```

on or about sequence number 00075300, from 325 to a value equal to 16 times the new maximum number of pollutants plus 69. For example:

```
    03  FILLER                 PIC X(357).
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
    03  SAVE-POINT-DATA        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00076200, from 16 to the new maximum number of pollutants. For example:

```
    03  SAVE-POINT-DATA        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

- Retriever

Change the OCCURS clause of the following phrase:

```
02  ANS-MAST-RPT1              OCCURS 1 TO 16 TIMES
```

on or about sequence number 00006900, from 16 to the new maximum number of pollutants. For example:

```
02  ANS-MAST-RPT1              OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  ANS-MAST-RPT2              OCCURS 1 TO 16 TIMES
```

on or about sequence number 00007800, from 16 to the new maximum number of pollutants. For example:

```
02  ANS-MAST-RPT2              OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
```

on or about sequence number 00018600, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00020400, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 16 TIMES
```

on or about sequence number 00025100, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 16 TIMES
```

on or about sequence number 00026100, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the VALUE clause of the following sentence:

```
77  MAX-CARD2                  PIC 99 COMP SYNC VALUE 16.
```

on or about sequence number 00033000, from 16 to the new maximum number of pollutants. For example:

```
77  MAX-CARD2                  PIC 99 COMP SYNC VALUE 18.
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  POLLUTANT-EMISSIONS        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00053100, from 16 to the new maximum number of pollutants. For example:

```
02  POLLUTANT-EMISSIONS        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  EMISSION-FACTOR-INFO       OCCURS 1 TO 16 TIMES
```

on or about sequence number 00057700, from 16 to the new maximum number of pollutants. For example:

```
02  EMISSION-FACTOR-INFO       OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the PICTURE clause of the following sentence:

```
    03  FILLER                 PIC X(325).
```

on or about sequence number 00060600, from 325 to a value equal to 16 times the new maximum number of pollutants plus 69. For example:

```
    03  FILLER                 PIC X(357).
```

will increase the maximum to 18 pollutants.

- **Master File Sorter**

Change the OCCURS clause of the following phrase:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
```

on or about sequence number 00013300, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00015100, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 16 TIMES
```

on or about sequence number 00019800, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 16 TIMES
```

on or about sequence number 00020800, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  OUT-MAST-RPT1             OCCURS 1 TO 16 TIMES
```

on or about sequence number 00022600, from 16 to the new maximum number of pollutants. For example:

```
02  OUT-MAST-RPT1             OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  OUT-MAST-RPT2             OCCURS 1 TO 16 TIMES
```

on or about sequence number 00023500, from 16 to the new maximum number of pollutants. For example:

```
02  OUT-MAST-RPT2             OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the PICTURE clause of the following sentence:

```
02  SORT-MSTR-RECORD          PIC X(852).
```

on or about sequence number 00025200, from 852 to a value equal to 45 times the new maximum number of pollutants plus 132. For example:

```
02  SORT-MSTR-RECORD          PIC X(942).
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
    03  SORT-MAST-RPT1        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00027300, from 16 to the new maximum number of pollutants. For example:

```
    03  SORT-MAST-RPT1        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
    03  SORT-MAST-RPT2         OCCURS 1 TO 16 TIMES
```

on or about sequence number 00028700, from 16 to the new maximum number of pollutants. For example:

```
    03  SORT-MAST-RPT2         OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the VALUE clause of the following sentence:

```
77  MAX-CARD2                  PIC 99 COMP SYNC VALUE 16.
```

on or about sequence number 00036600, from 16 to the new maximum number of pollutants. For example:

```
77  MAX-CARD2                  PIC 99 COMP SYNC VALUE 18.
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  POLLUTANT-EMISSIONS        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00056700, from 16 to the new maximum number of pollutants. For example:

```
02  POLLUTANT-EMISSIONS        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  EMISSION-FACTOR-INFO       OCCURS 1 TO 16 TIMES
```

on or about sequence number 00061300, from 16 to the new maximum number of pollutants. For example:

```
02  EMISSION-FACTOR-INFO       OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the PICTURE clause of the following sentence:

```
    03  FILLER                  PIC X(325).
```

on or about sequence number 00062700, from 325 to a value equal to 16 times the new maximum number of pollutants plus 69. For example:

```
    03 FILLER                   PIC X(357).
```

will increase the maximum to 18 pollutants.

- **File List Output**

  Change the OCCURS clause of the following phrase:

  ```
  02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
  ```

  on or about sequence number 00012500, from 16 to the new maximum number of pollutants. For example:

  ```
  02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
  ```

  will increase the maximum to 18 pollutants.

  Change the OCCURS clause of the following phrase:

  ```
  02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
  ```

  on or about sequence number 00014300, from 16 to the new maximum number of pollutants. For example:

  ```
  02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
  ```

  will increase the maximum to 18 pollutants.

  Change the OCCURS clause of the following phrase:

  ```
  02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 16 TIMES
  ```

  on or about sequence number 00019000, from 16 to the new maximum number of pollutants. For example:

  ```
  02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 18 TIMES
  ```

  will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 16 TIMES
```

on or about sequence number 00020000, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

- Summary Report Output

In member GDOMSTR, change the OCCURS clause of the following phrase:

```
02  OLD-MAST-RPT1                OCCURS 1 TO 16 TIMES
```

on or about sequence number 00000900, from 16 to the new maximum number of pollutants. For example:

```
02  OLD-MAST-RPT1                OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

In member GDOMSTR, change the OCCURS clause of the following phrase:

```
02  OLD-MAST-RPT2                OCCURS 1 TO 16 TIMES
```

on or about sequence number 00001700, from 16 to the new maximum number of pollutants. For example:

```
02  OLD-MAST-RPT2                OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

In member GDPNTSRC, change the OCCURS clause of the following phrase:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
```

on or about sequence number 00006600, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

In member GDPNTSRC, change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00008400, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

- NEDS Point Source Output

Change the OCCURS clause of the following phrase:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
```

on or about sequence number 00014500, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00016300, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 16 TIMES
```

on or about sequence number 00021000, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 16 TIMES
```

on or about sequence number 00022000, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

- NEDS Area Source Output

Change the OCCURS clause of the following phrase:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 16 TIMES
```

on or about sequence number 00012800, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-POLLUTANT-EMISSIONS  OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 16 TIMES
```

on or about sequence number 00014600, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-DATA        OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 16 TIMES
```

on or about sequence number 00019100, from 16 to the new maximum number of pollutants. For example:

```
02  MSTR-EMISSION-FACTOR-INFO OCCURS 1 TO 18 TIMES
```

will increase the maximum to 18 pollutants.

Change the OCCURS clause of the following phrase:
02 MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 16 TIMES
on or about sequence number 00020100, from 16 to the new maximum number of pollutants. For example:
02 MSTR-EMISSION-FACTOR-DATA OCCURS 1 TO 18 TIMES
will increase the maximum to 18 pollutants.

INCREASING NUMBER OF MACHINE PROCESS SEGMENTS

Whenever it is desired to change the maximum number of machine process segments (type 2) to be handled by EIS/P&R, it is necessary to modify the following programs:

Emission Factors Transaction Generator
File Maintenance
Retriever
Master File Sorter

The current limit for the maximum number of machine process segments handled by EIS/P&R is 6.

The following paragraphs discuss the changes to be made in each program described above.

- **Emission Factors Transaction Generator**

  Change the OCCURS clause of the following sentence:

  ```
  02  SAVE-TYPE2-RECORDS        OCCURS 6 TIMES.
  ```

  on or about sequence number 00058300, from 6 to the new maximum number of machine process segments. For example:

  ```
  02  SAVE-TYPE2-RECORDS        OCCURS 8 TIMES.
  ```

  will increase the maximum to 8 machine process segments.

- **File Maintenance**

  Change the VALUE clause of the following sentence:

  ```
  77  MAX-SET2                  PIC 99 COMP SYNC VALUE 6.
  ```

  on or about sequence number 00046500, from 6 to the new maximum number of machine process segments. For example:

  ```
  77  MAX-SET2                  PIC 99 COMP SYNC VALUE 8.
  ```

  will increase the maximum to 8 machine process segments.

Change the OCCURS clause of the following sentence:

```
02  SAVE-SET2                    OCCURS 6 TIMES.
```

on or about sequence number 00074300, from 6 to the new maximum number of machine process segments. For example:

```
02  SAVE-SET2                    OCCURS 8 TIMES.
```

will increase the maximum to 8 machine process segments.

- Retriever

  Change the OCCURS clause of the following sentence:

  ```
  02  SAVE-SET2                    OCCURS 6 TIMES.
  ```

  on or about sequence number 00060100, from 6 to the new maximum number of machine process segments. For example:

  ```
  02  SAVE-SET2                    OCCURS 8 TIMES.
  ```

  will increase the maximum to 8 machine process segments.

- Master File Sorter

  Change the OCCURS clause of the following sentence:

  ```
  02  SAVE-SET2                    OCCURS 6 TIMES.
  ```

  on or about sequence number 00062200, from 6 to the new maximum number of machine process segments. For example:

  ```
  02  SAVE-SET2                    OCCURS 8 TIMES.
  ```

  will increase the maximum to 8 machine process segments.

Appendix D - Disk to Tape Conversion

EIS/P&R was developed as a system which could be either a tape system or a disk system. The system, as delivered to the Environmental Protection Agency and as shown in the job control language of the catalogued procedures, is a disk system. The changes to convert to tape are minor can be accomplished easily by a person experienced in the use of job control language. This conversion is accomplished entirely by altering items in the catalogued procedures (specifically disk defaults and DD cards.)

The catalogued procedures which create disk files to be saved or large disk files are the candidates for change. The catalogued procedures are:

PNRFUPDT - Master File (always)
PNRRETVR - Answer File (if large or to be saved)
PNRSORTR - Sorted Master File (if large or to be saved)
PNRTBGEN - Emission Factors Table (always)

The steps to be followed in changing each of the above procedures are:

A. Remove space parameters from the defaults (i.e., SPCUNIT, PRIMARY, SECNDRY).

B. Remove space parameters from the DD cards associated with the appropriated file. (i.e., SPACE = (&SPCUNIT, (&PRIMARY, &SECNDRY), RLSE).

C. Replace these space parameters with label information if the operating system will label the tape other than the user wants.

D. Change the default unit to a tape specification appropriate for the user's system.

E. Remove the serial parameter from both the defaults and the DD cards if in the user's system a specific identification is not necessary.

Appendix E

GLOSSARY

AQCR	Air Quality Control Region
BEC	Basic Equipment Classification
BTU	British Thermal Unit
CDHS	Comprehensive Data Handling System
De	Equivalent Diameter
ECAP	Emergency Control Action Program
EIS/P&R	Emission Inventory/Permits and Registration Subsystems
EOF	End of file
EPA	Environmental Protection Agency
ID	Identification
IPP Code	Implementation Planning Program Code
NEDS	National Emissions Data System
OSRI	Originating Station Routing
PWCS	Points with common stock
P&R	Permits and Registration
SAROAD	Storage and Retrieval of Aerometric Data
SCC	Source Classification Code
SE	Systems Engineer
SIC Code	Standard Industrial Classification Code
USGS	United States Geological Survey
UTM	Universal Transverse Mercator